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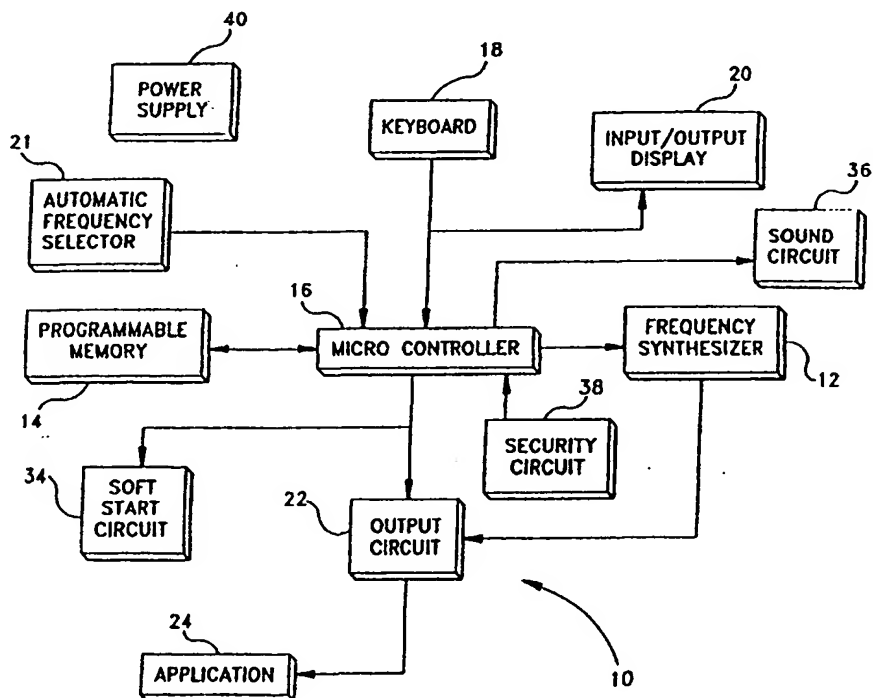
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(54) Title: BIO-ACTIVE FREQUENCY GENERATOR AND METHOD HAVING REPLACEABLE MEMORIES

(57) Abstract

A system and method for generating bio-active frequencies having precision within 0.001 Hz is used to kill microorganisms and viruses, and to enhance human tissue regeneration. A specific precise frequency synthesizer (12) is controlled by a programmable control (14) hard wired in the device that instructs the synthesizer to generate a specific precise frequency or a series of precise frequencies. In a second embodiment, the programmable control (14) may be one of a number of different plug-in modules which is programmed for a specific group of frequencies that have been approved for medical or food processing use by the controlling governmental body (e.g., the FDA in the United States). A keyboard (18) is actuated by a user to select a specific frequency or a sequence of frequencies or a series of frequencies. Depending upon the specific frequency being generated, a circuit gates the generated signal ON or OFF with a predetermined periodic pattern. The system further comprises a display (20) for showing user selected frequencies, a sound circuit (36) for generating a pre-stimulation audio warning, application means (24), and a contact indicator (not shown). The application means (24) may have a wireless connection to the output circuit (22).



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TITLE

BIO-ACTIVE FREQUENCY GENERATOR AND METHOD HAVING
REPLACEABLE MEMORIES

1. Field of the Invention

This invention relates in general to an improvement in the field of devices for health science applications and other applications that include industrial control of micro-organisms, and more particularly but not by way of limitation, to a device and method for generating with extremely high accuracy specific frequencies and sequences of specific frequencies that are particularly adapted for killing micro-organisms and viruses and for enhancing metabolic tissue functions in mammals.

2. Description of the Prior Art

The use of electrical stimulation in health science applications involving humans has long been known and it has been reported that one of the earliest attempts to suppress organic pain and other neurophysical effects utilizing electrical stimulation may have occurred as early as 2,000 years ago, when it was reported that gout could apparently be successfully treated by placing a diseased extremity in a tub of water containing electric eels. Apparently, attempts were also made to treat headaches with a similar treatment.

Since that early time many devices and methods have been devised to use electricity and electromagnetic fields for medical purposes. For example, U. S. Patent No. 4,598,713 was issued on July 8, 1986 to Achim Hansjurgens et al for ELECTROSTIMULATION THERAPY DEVICE AND METHOD. This device relates to electrostimulation therapy of the electrical interference therapy type. In this therapy medium frequency voltages with frequencies in the range of a few thousand Hz are applied over at least two circuits, each with one pair of

electrodes, which differ from each other by a low frequency range of from a few to a few hundred Hz, so that stimulations, and thereby therapeutically effective oscillations called beats, occur with correspondingly low frequency in the body. This device stores data representative of signals having predetermined instantaneous value variations with time. These values are used to construct electrical signals having curves that represent both the medium frequency output signals and the interference beats with sufficient stability of frequency that makes possible small spacing of adjacent frequencies.

U. S. Patent No. 5,304,486 issued to Donald C. Chang for a METHOD OF AND APPARATUS FOR CELL PORATION AND CELL FUSION USING RADIO FREQUENCY ELECTRICAL PULSE relates to the poration and fusion of cells using high-power radio frequency electrical pulses. A power function generator applies a continuous AC electrical field and/or a high-power pulsed radio frequency electrical field to induce cell congregation by the process of dielectrophoresis which porates or fuses the cells. The method can be used with a variety of cells including animal cells, human cells, plant cells, protoplasts, liposomes, bacteria and yeasts. It also can introduce into such cells a large variety of chemical agents including DNA, RNA, antibodies, proteins, drugs and inorganic chemicals.

U. S. Patent No. 4,917,092 was issued on April 17, 1990 to G. A. Todd et al for TRANSCUTANEOUS NERVE STIMULATOR FOR TREATMENT OF SYMPATHETIC NERVE DYSFUNCTION. This nerve stimulator is to be used in T.E.N.S. (Transcutaneous Electrical Nerve Stimulation) therapy and provides for generating pulses with the pulse width, rate, and amplitude being modulated over a modulation cycle to stimulate the autonomic and central nervous system of a patient. A sympathetic nerve dysfunction is treated with a low frequency of pulses, while through the

strength-duration modulation at higher pulse rates the patient's nociceptors are addressed so that the autonomic nervous system is stimulated for more than 5 % of the amount of time as said central nervous system.

U.S. Patent No. 4,509,520 was issued on April 9, 1985 for an ELECTRICAL STIMULATING APPARATUS and is directed toward stimulating osteogenesis in a living body. The device is a light weight, low drain, battery operated stimulating instrument to be carried by a patient during treatment for applying a high frequency alternating current treatment signal to the skin of the patient according to a treatment program and creating a record of such treatment. A stimulating signal of 60 Hz is generated and has a square or sine waveform.

U.S. Patent No. 4,305,390 issued to M. R. Swartz for a METHOD FOR GENERATING OXYGEN IN AN EXCITED ELECTRONIC STATE AND INACTIVATION OF MICROORGANISMS and contemplates a system for inactivation of such microorganisms and their products, for example, Herpes simplex viruses by superposition of a component such as methylene blue plus light, oxygen and electricity. This system generates the superoxide radical anion and consequently hydrogen peroxide and the hydroxyl radical, both of which enter into the inactivation process.

U. S. Patent No. 4,428,050 discloses a tanning device for monitoring time integrated exposure to UV radiation and indicating the achievement of preselected dosages of such exposure for obtaining a desired tan.

U. S. Patent No. 4,535,775 discloses a method healing bone fractures non-invasively by applying to electrodes coupled to the skin of a living body in the vicinity of a bone fracture an alternating voltage having a wave form that is symmetrical with respect to the axis, a frequency in the range of 20-100 KHZ and a value in the range from about 2 to 10 volts peak to peak.

It has also been found that each species of life has its own unique electronic signature. Accordingly, every micro-organism has its own specific molecular oscillation pattern. It has also been found that if such micro-organism is subjected to a specific precise electrical frequency signal at a predetermined amplitude it is possible to inactivate or kill such micro-organism while not effecting any other micro-organism or tissue. While the process by which such inactivation of the micro-organism takes place when subjected to such precise frequency signal is not fully understood, it is apparent that such procedure is efficacious. Also, it has been found that subjecting the tissue of a mammal to a specific precise frequency signal does enhance tissue regeneration. For present purposes, such precise frequency signals are termed bio-active frequencies and it is apparent that a need exists for a device to generate upon command such precise bio-active frequency electrical signals for desired applications which may include health science applications and other industrial and commercial applications. Such a device would be able to generate specific bio-active frequency signals selected by a user of the device as well as to generate specific bio-active frequency signals that were preprogrammed into the device for selection by a user for a particular health science, industrial or commercial application.

This application is a further improvement on my prior applications, namely serial No. 08/541,182 and 08/787,158 filed on October 11, 1995 and January 22, 1997 respectfully. This application is a CIP of the later application.

It is believed that such need is further advanced by the instant invention and the particular method employed by it to generate such bio-active frequencies as desired.

SUMMARY OF THE INVENTION

Briefly stated, the present invention contemplates a system and method to generate an electrical output signal having a precise frequency and particularly adapted for use in applications for which it may be particularly suited such as health science applications and other applicable industrial and commercial applications. The particular precise frequency signal generated may be a single frequency signal that is generated for a predetermined period of time or may be a first frequency signal that is generated for a predetermined period of time and which is then followed by a second or further frequency signals that are also generated for predetermined periods of time or may be a beat frequency created by heterodyne action of two carrier frequencies as in an optional antenna array designed for use with this device. The precise frequency output signal may also be a continuous signal or may be interrupted for predetermined periods of time to provide a signal that is ON for a controllable period of time and then OFF for a constant recurring interval. The continuous precise frequency signal is believed to be particularly useful in the inactivation of micro-organisms while the frequency signal that is periodically ("pulsed") interrupted is believed to be useful for tissue regeneration purposes and metabolic tissue functions for mammals.

The system of the present invention for generating such precise frequency output signals includes a frequency synthesizer means that is a response to a control signal to generate a precise frequency output signal. A programmable control means is coupled to the frequency synthesizer means and is operated to generate a determinable control signal selected by a user of the system for application to the frequency synthesizer means. The control means may be programmed to generate single precise frequency signal or it may be programmed

to generate a sequence of control signals for generation of a series of frequency output signals, such sequence of precise frequency output signals may be termed the SEQUENCE programs. The control means may also be preprogrammed so that a particular command from a user of the system is operative to generate a predetermined sequence of precise frequency output signals, such series of precise frequency output signals may be termed the AUTO programs. The programmable control means also stores instructions associated with a particular specific frequency which indicate whether the precise frequency output signal is to be generated as a continuous signal or whether periodic interruption intervals are to be interposed into the signal. If an interruption interval is to be interposed into the precise frequency output signal, that interval is determined to be generally around one second in duration. The period that the precise frequency output signal is ON between intervals is controllable by a user of the system and will be from about one to seven seconds.

An output circuit is coupled to the frequency synthesizer means for generation of an amplified output signal that is coupled to application means for use in a particular desired application such as health science applications and other selected industrial and commercial applications. In the instance of the application of the amplified output signal to mammals, the amplitude of the output signal may be adjusted for maximum efficiency while avoiding undue discomfort to the subject of such signal. Further, the present invention provides circuitry associated with the output signal that provides for the amplified output signal, at the start of each specific frequency, to gradually have its amplitude increased from zero to a predetermined amplification level at a predetermined rate to avoid any inadvertent momentary discomfort

to a recipient of the amplified output signal in a "soft" start of each precise frequency output signal. In addition, a no output signal interval is interposed at the start of each frequency signal and between each precise frequency signal in a sequence of frequencies so that an audio circuit may be activated to provide an auditory alert to the recipient of the amplified output signal of the ensuing change of the frequency signal.

The system is provided with a keyboard means for actuation by a user of the system to select a specific precise frequency output signal, or a sequence of precise frequency output signals or a preprogrammed sequence of frequency signals, the AUTO mode. Two separate controls are also actuatable to determine amplitude level of the output signal and the ON pulse time of a precise frequency output signal that is subject to intervals of no signal. A display means is associated with the keyboard means to display information relating to actuation of the keyboard and to status of a particular output signal then being generated.

The amplified output signal generated by the output means is applied to a subject such as a mammal by spaced electrode means that are placed in direct contact with the subject in a predetermined manner. The electrode means may take several forms according to that judged most applicable for the particular application. For example, the object to be treated may also be immersed in a vat or container of a conductive fluid medium such as water, which may or may not contain electrolytes, to improve conduction of the electrical precise frequency output signal therethrough. In an application such as food processing, the use of a conductive fluid medium is particularly well suited since it permits amplification of the precise frequency signal to a high levels that achieves greater penetration than is safe

or easily tolerated by living subjects such as mammals.

The precise frequency output signal is generated in a manner to ensure maximum stability and is stable to at least 0.001 Hz. Such generated precise frequency output signal is also accurate to 0.000001 Hz at the lower service range of frequencies as will be set forth hereinafter.

The system of the present invention, other than the application means, is housed in a separable enclosure which is not intended to be opened by unauthorized parties. A security circuit is provided which is operative upon opening of the enclosure to disable the system.

In a second embodiment, the control memory is removable rather than hard wired to the circuit. This feature allows for a substitution of memories to insure compliance with the local governmental laws, as by way of example and not by way of limitation, the United States FDA has only approved certain frequencies for the medical field. In the second embodiment, the control memory included in the machine will only allow FDA approved frequencies to exit the device. In other countries where different limitations exist a second different control memory would be included with the machine so that only countries frequencies can exit the device. Other frequencies would likewise require different control memories.

In addition the second embodiment has an output jack which has the output frequencies available at very low power. A wireless transmission means such as a RF transmitter or the like can be connected to the output jack to transmit the frequency output from the device to a spaced apart location to a receiving device which is connected to the application means.

Other features and attendant advantages of the present invention will become apparent to those skilled in the art from a reading of the following detailed description constructed in

accordance with the accompanying drawings and wherein:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram a system constructed in accordance with a preferred embodiment of the present invention.

FIG. 2 a perspective of the display and keyboard of the block diagram of FIG.1.

FIGs. 3a,3b, 3c, 3d and 3e together form a schematic diagram of primarily the keyboard and display aspects of the system.

FIGs. 4a, 4b, 4c, 4d, 4e, 4f, 4g, 4h and 4i together form a schematic diagram of primarily the micro controller and programmable control portions of FIG. 1.

FIGs. 5a and 5b together form a schematic diagram of primarily the frequency synthesizer of FIG. 1.

FIGs. 6a and 6b together form a schematic diagram of primarily the input power supply of the system.

FIG. 7 is a schematic diagram of primarily the output circuit of the system.

FIG. 8 is a schematic diagram of primarily the security circuit of the system.

FIG. 9 is a simplified perspective of the invention and an exemplary application electrode means.

FIG. 10 is a simplified perspective of an alternative application electrode means.

FIG. 11 is a waveform of one specific precise frequency output signal.

FIG. 12 is a waveform illustrating the gated ON/OFF intervals of a frequency output signal.

FIG. 13 is a waveform illustrating a soft start for the initiation of a frequency output signal.

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FIG. 14 is a waveform illustrating the interval between two successive frequency output signals and the soft start of the succeeding frequency signal.

FIG. 15 is a block diagram of a second preferred embodiment of the invention.

FIG. 16A and 16B combined schematic showing of the removable socket for receiving the removable control memory.

FIG. 17 depicts the plug for receiving the removable memory and the removable memory chip.

DETAILED DESCRIPTION OF THE DRAWINGS

Referring now to the drawings in detail and in particular to FIG. 1, the reference character 10 generally designates a system constructed in accordance with a preferred embodiment of the invention. The system 10 includes a frequency synthesizer means 12 that is responsive to a control signal to generate a precise frequency output signal having a frequency selected from a range of about 0.00004 Hz. to 3Mhz. The output waveform of the frequency synthesizer preferably has a square wave output with a 50% duty cycle. The frequency generated by the frequency synthesizer is very precise since for some health science applications a variance of 1 Hz. is acceptable while for other health science applications a variance of no more than 0.001 Hz. would be desirable. Accordingly, it is desirable for the frequency range of 0.00004 Hz to 3Mhz. contemplated to be generated by the synthesizer 12 such that a variance of less than 0.001 Hz be achieved, which requirement is met by the frequency synthesizer means shown in greater detail hereinafter. A representation of such precise frequency output signal is seen in FIG. 11.

A programmable memory control means 14 is coupled to the frequency synthesizer circuit 12 through a suitable micro

controller means 16 to instruct the frequency synthesizer 12 as to the specific frequency output signal the frequency synthesizer 12 is to generate. The control means 14, which will be seen in greater detail hereinafter, includes EPROM and EEPROM integrated circuits, and is operable to store control signals representative of a single specific precise frequency output signal and a sequence of precise frequency output signals. The control signals for the programmable storage means 14 for the generation of a particular frequency or frequencies may be generated by the actuation of a keyboard means 18 which is coupled through the micro controller 16 to the programmable memory control means 14.

Actuation of the keyboard means, which is seen most clearly in FIG. 2, by a user permits the selection of a single specific frequency and the selection of a sequence of predetermined frequencies. In addition, a user of the system 10 may also choose a predetermined sequence of specific frequencies by choosing only one number which is representative of a number of such predetermined frequencies that are arranged in a predetermined sequence. The keyboard means 18 is coupled to a suitable input/output display means 20 through the micro controller 16. The display means 20, as seen in FIG. 2, displays information representative of the specific frequency output signal or sequence of output signals and a number, if chosen, that is representative of a predetermined number of specific frequency output signals that are automatically selected by selection of one representative number by a user. In addition, the display means 20 displays information relating to the time selected for a particular specific frequency signal to run and to the time remaining for a particular specific frequency signal to be generated by the system 10, either singly or as part of a chosen sequence, during the running of the

system 10. The system 10 also includes an automatic frequency or channel selector 21 which is coupled to the micro controller 16. The term channel may also be used at times herein to designate a precise frequency output signal. The automatic frequency selector 21 is arranged to be placed in contact with a subject for purposes of scanning such subject and selecting automatically a particular sequence of precise frequency output signals for application to such subject. Such selection is based on sensing the frequency pattern of a subject and then determining the appropriate sequence of precise frequency output signals to be generated automatically in response to the condition sensed.

The frequency synthesizer 12 is coupled to a suitable output circuit 22 for amplification to a desired value. The output circuit 22 is then connected to a suitable application means 24 for applying the amplified specific precise frequency output signal to a subject for a desired application, which may be health science, industrial, commercial or other as desired.

As seen in FIGS. 9 and 10, the system 10, except for the application means 24, is contained within a suitable enclosure 26. The application means may take the form of electrically conductive electrodes 28 in the form of elongated stainless steel cylinders that are connected to the system by suitable leads 30. The conductive cylinders are adapted to be held in the hands of a user of the system 10. The electrodes 28 may also take any suitable form such as the electrically conductive metal foil strips 32 shown in FIG. 10. Preferably, the foil strips 32 are covered in cloth coverings that are wet by a suitable electrically conductive fluid such as water to ensure that the amplified output signal properly flows through the electrode means. In such applications as may require the use of the metal foil strips as seen in FIG. 10, the strips 32 are placed in

contact with the body or an extremity of a subject and are arranged in a directly opposing manner so as to position the afflicted extremity or afflicted portion of an extremity or the like directly between such electrode means. The term application means 24 should also be construed to include means to apply the specific frequency signals for such applications as industrial and commercial uses. In such instances a suitable transmitter of such frequency signals could be wire screens immersed in containers or vats of a conductive fluid, such as water, for the transmission of the frequency signals to a subject such as food which is to be sanitized or disinfected by these specific frequency signals.

The system 10 has additional affirmative features. Upon application of a control signal to the frequency synthesizer means 12 to generate a specific precise frequency output signal for application to the output circuit 22, a signal is directed to a circuit 34 which is termed a soft start circuit and which is coupled to the output circuit 22. As seen most clearly in FIG. 13, the soft start circuit 34 is operative at the initiation of a specific precise frequency signal to gradually increase the value of the amplified frequency output signal from the output circuit 22 at a predetermined rate from zero to a predetermined ultimate determinable output value. As shown in FIG. 13, this ramp up of the amplified output signal takes place in a predetermined time period which for present purposes has been chosen to be a time period around 0.25 sec. Such a ramp up or soft start of the amplified output signal permits the subject to become quickly acclimated to the application of such signal through the output means without undue surprise to the subject. The soft start application of the amplified output signal, as seen also in FIG. 14, is interposed at the start of each specific precise frequency signal, including all frequency

signals which appear in a predetermined sequence.

Another feature of the system 10 is an audio warning circuit 38 which coupled to the micro controller 16 that directs the sound circuit 36 to sound an audible sound or alarm prior to the initiation of the application of a specific precise frequency output signal to the output means 22. The purpose of the audible signal or alarm by the circuit 36 is to alert a subject to which the application means 24 have been applied of the initiation of application of the amplified output signal. As seen in FIG. 14, a time period of around 5 to 10 seconds is interposed between specific frequency signals appearing in a sequence and at the commencement of a single specific precise frequency signal to permit the auditory signal to be sounded for a desired predetermined period of time to permit a subject to which the application means 24 is applied to anticipate the commencement of the amplified output signal without surprise.

A security circuit 38 is connected to the micro controller 16. The enclosure 26 for the system 10 is separable for access to the system as may be required. To ensure integrity of the system 10, the security circuit 38 is operative upon opening of the enclosure 10 to disable the system 10 from further operation until the circuit has been reset by a an authorized person.

A suitable power supply 40 for the system 10 is included to supply requisite electrical power to all components of the system. The power supply 40 preferably receives input electrical power at 8 to 20 V DC or AC and with a Hz of 50 to 400, with at least around 1 ampere.

Referring again to FIG. 10, the actuable portion of the keyboard means 18 and the visual display portion of the display means 20 will be seen on the upper portion of the enclosure 26. The visual portion, illustrated by four single digit numbers 21, of the display means 20 displays information representative of

a specific bio-active precise frequency signal either being selected by a user of the system 10 prior to starting the system to generate bio-active frequency signals or is representative of a specific precise frequency signal then being generated by the system 10. The first two digits of the three digits 23 of the display 20 also display the time selected by a user by actuation of the keyboard means 18 for a particular frequency or channel to be run. The full three digits 23 of the display 20 also display the time remaining for a specific precise frequency output signal to be generated to suitably inform the user of the system.

As previously discussed with respect of FIG. 12, an OFF signal may be generated by the system 10 to provide a desired ON/OFF cycling of certain frequency output signals with the OFF period remaining constant at around 1 sec. and the ON period of the frequency output signal being variable between about 1 to 7 sec. according to the control of a user. The period for the frequency signal to be generated, as noted above, is determined by actuation of the keyboard means 18 and would generally be considered to be around three minutes in duration.

In the illustrated embodiment of the invention, the ON pulse period for a particular frequency signal is displayed by the single digit display 42 and such ON pulse period may be determined by a user by selective actuation of a switch 44 to increment the pulse period displayed to the desired period of time. In addition, a LED display 45 provides a visual indication to a user of the system 10 of the existence of an ON period for the precise frequency output signal.

The enclosure 26 is provided with a suitable ON/OFF switch 46 for the system 10. In the present instance, output receptacles 48 are provided for the electrode means 24 at the upper portion of the enclosure 26.

As was previously described, the amplitude of the amplified output signal is determinable by a user of the invention. A suitable amplitude control 50, such as for, example, a variable resistor, permits a user to adjust the amplitude of the amplified frequency output signal to a comfortable level commensurate with sufficient amplitude to accomplish the desired health science and/or commercial application. Generally, this amplitude is not expected to exceed a level of around 50 volts. Another LED 52 displays further information concerning the application of the amplified output signal to a subject and indicates if the electrode means 24 are not in proper contact with the subject by indicating that an open circuit condition has been sensed by the invention so that proper corrective action may be taken to ensure proper application of the electrode means 24 and correct flow of the output signal.

The illustrated portion of the keyboard means shows various keys AUTO, RUN, SEQ, DEL, SELECT, and RESET that may be actuated by a user of the invention to choose a specific frequency signal or a sequence of such signals or to choose a preprogrammed sequence of signals or to store for future access a predetermined sequence of frequency signals.

As an example of an exemplary application of the present invention, the following table sets forth a number of conditions that may be encountered in the health science field. The table also indicates a particular code or channel which is representative of a specific frequency output signal that may be applied to advantage in alleviating such condition or inactivating a particular micro-organism which is responsible for such condition. As will be noted, in some instances a plurality of frequencies or sequences of frequencies may be used to advantage.

CONDITION

REPRESENTATIVE

FREQUENCY

NUMBER

Adynamia, geriatric (fatigue of age)--

(applicators placed on solar plexus and behind animal's head)--
49, 56

Abdominal inflammation--31, 82, 4, 5, 6, 9, 10, 12 + 16, 14, 15,
17, 18, 20, 28, 29 + 86, 88, 42, 45, 48, 58, 103, 104, 105, 106,
107, 112, 118, 119, 121, 125

Abdominal pain (applied to solar plexus and belly--78, 104, 45,
40, 57, 87, 88, 108, 109, 114, 1, 3. Also for parasites+86, 42,
45, 48

Abscesses--4, 6, 14, 17, 20, 39, 101

Acidosis (urine too acid)--1, 14, 16, 17, 18, 20, 58, 88

Acne--4, 6, 9, 10, 12, 14, 17, 20

Actinomycosis--28, 1, 17, 20, 58

Acupuncture disturbance field (scar focus)--59

Acute Pain--40, 57, 3, 45, 87, 88, 108, 109, 114, 1, 14, 17, 20
+ 22 + 24

Adenoids--11 + 16, 14, 17, 18, 20, 29, 58, 105, 106, 107, 109,
110, 112, 116, 117, 121, 123, 4, 6

Adhesions--4, 6, 11 + 16, 14, 17, 18, 19, 20, 39

Adrenal stimulant--58

Allergy--1, 78 and 32, 87, 88, 108, 109, 114, 42, 45, 48, 58,
29 + 86

Alopecia (loss of hair)--1, 14, 17, 20, 28, 88

Amenorrhea (absence of menstruation)--29, 87, 88, 108, 109, 114,
42, 45, 48, 14, 1, 3, 17, 19, 20, 58

Anal itching (Pruritus)---28, 29, 42, 45, 48, 29 + 86, 58, 112,
87, 88, 108, 109, 114 (Secondary: 1, 14, 17, 19, 20)

Angina (quinsy--in throat)--17, 18, 20, 28, 105, 106, 107, 109,
110, 112, 117, 118, 119, 121

Ankylosing spondylitis--3, 45, 11 + 16, 14, 17, 18, 20, 25 + 26 + 27, 55, 82, 61, 54, 55, 69, 82, 43, 44, 49, 123, 105, 106, 109, 110, 112

Antiseptic effect--11 + 16, 14, 17, 19, 20, 28, 29, 103, 105, 106, 107, 108, 109, 110, 112, 118, 119

Apoplexy (stroke paralysis)--often caused by netzsitter geopathic zone 53, 58, 9, 25 + 26 + 27, 42, 45, 48, 58, 29 + 86, 87, 88, 108, 109, 114, 14, 17, 20

Appetite, lack of--28, 29 + 86, 42, 45, 48, 58, 1, 14, 17, 20

Arteriosclerosis (hardening of arteries: regeneration takes time but is accelerated by full-body sunbaths; stopped before reddening)--1, 4, 6, 9, 10, 12, 14, 17, 18, 20, 58, 123

Arthritis (since many different organisms can cause arthritis, many frequencies must be tested. See other types of arthritis below---)

1, 11, 14, 16, 17, 20, 55, 58, 69, 78, 82

Arthritis, rheumatoid of the muscles and tendons--34, 82, 25 + 26 + 27, 17, 20, 123

Arthritis, arthrosis, and parathyroid disturbances affecting calcium metabolism--62

Arthritis, arthralgia due to gout--63

Arthritis: focal origin (gastrogenic, tonsillogenic, and syphilis or paresis)--63

Asthma--4, 6, 9, 10, 12, 14, 17, 20, 123

Astrocytoma--65, 67, 69, 6, 7, 14, 22, 24

Ataxia (incoordination of muscles--slow results in some cases)--4, 6, 9, 10, 12, 14, 17, 18, 20, 25, 26, 27, 29 + 86, 42, 45, 48, 58, 121, 125 spastic ataxia--65, 67, 69

Athlete's Foot--Try 28 first, then 11, 14, 16, 20, 58

Autoimmune Disorders--1, 11 + 16, 14, 17, 18, 20, 25, 26, 27, 28, 34, 55, 58, 62, 63, 69, 78, 87, 88, 102

Autointoxication--85, 87, 88, 1, 14, 17, 20, 58, 108, 109, 114
Back pain--Best is 57 for 15 min. + 40, 3, 87, 88, 108, 109,
114. Others: 1, 19, 11 + 16, 14, 17, 20
Bad Breath (halitosis)--11 + 16, 14, 17, 20, 58
Bedsore--14, 11 + 16, 17, 20, 28 and 58; then 82 and 47
Biliousness--11 + 16, 1, 14, 15, 17, 20, 28
Bladder and prostate complaints--14, 11 + 16, 17, 20, 28, 58,
63

Boils--14, 11 + 16, 17, 20, 28, 106, 107, 109
Bone trauma (cuts, fractures)--31, 11 + 16, 1, 14, 17, 20
Bone/periodontal disease (also osteomalacia, etc., greatly aided
by full-body sun exposure) 51, 9, 10, 25 + 26 + 27, 14, 17, 18,
20
Bone protuberance (spurs)--82 and 34
Brachial Neuralgia (electrodes placed on elbow and head)--85
Breast: fibroid cysts--14, 11 + 16, 17, 18, 20 + 22 + 24
Bright's Syndrome (Nephritis)--12, 14, 17, 20
Bronchial asthma--85, 87, 88, 42, 45, 48, 29 + 87, 58
Bronchitis--14, 20, 63, 64
Bronchial Pneumonia--11 + 16, 14, 17, 18, 20
Bubonic Plague--101, plus secondary infections: 14, 17, 20, 58
Burns--39, 1, 14, 17, 20, 28, 38
Bursitis (may be caused by many viruses; also experiment with
arthritis frequencies)--14, 17, 20
Cancer: see Carcinoma, Leukemia, and Sarcoma
Candida--28
Carcinoma--7, 14, 17, 20 + 24 + 22, 107
Cardiac Edema (congestive heart failure)--65
Carpal Tunnel Syndrome--11 thru 28, 71, 41, 80, 20, 87, 88, 29
Cataract--1, 14, 17, 20
Catarrh--11 # 16, 14, 17, 20, 29, 58

Cerebral Palsy--14, 17, 20, 87, 88

Chicken Pox (Varicella)--11 + 16

(and for secondary infections)--9, 10, 12, 14, 17, 20, 58

Cholera--14, 16, 103, 14, 17, 20

Chronic Fatigue Syndrome (generic disorder)--1, 4, 9, 14, 16, 17, 18, 20, 28, 29 + 86, 32 41, 42, 45, 47, 48, 54, 56, 58, 71, 74, 105, 106,

Circulatory stasis--53

Circulation disturbances/problems--53, 63

Concentration (to increase mental)--68

Cold in head, chest (Common cold/Adenoviruses mutate constantly; there are too many new strains to include a complete list for every cold)--

1, 11, 14, 16, 17, 18, 20, 29, 58

Colic--11, 15, 16, 17, 20, 58

Colitis (irritation of colon)--11, 14, 15, 16, 104

Constipation--11, 14, 16, 17, 18, 20, 58

Convulsions--1, 14, 17, 20 (most commonly used)

Contusions--66 and 43 over the focus

Costalgia (rib pain)--40, 57, 3, 14, 17, 20, 1, 11 + 16

Cramps--1, 14, 17, 20, 57

Cystitis (of urinary bladder)--11, 14, 16, 17, 20, 28, 58

Deafness (partial to complete)--1, 11, 14, 16, 17, 20, 58

Dental foci (neglecting this can prevent recovery from ANY illness)--3, 45, 39, 51, 10, 11 + 16, 12, 14, 15, 17, 18, 19, 20, 24 + 25 + 27, 28, 47, 5, 9, 87, 88, 108, 109, 114

Depression, anxiety, trembling, weakness--77

Depression (due to exogenous circumstances--54 and 17

Depression (due to drugs or toxins)--83 and 47

Detoxification--71, 41, 80, 20, 87, 88, 29, 24, 105, 14, 17, 108, 109, 114

Diabetes--54 + 111 + 17, and 61 + 34, 25 + 26 + 27, 42, 45, 48

+ 58 + 86, 87, 105 and 53 + 63 for circulation problems.

for secondary infections: 1, 4, 6, 9, 11, 14, 16, 20, 28, 58

Diabetic loading--54 and 21

Diarrhea /Dysentery--11, 14, 16, 17, 20, 28

Distorsion (Twisting of muscles, spine)--66 and 43

Dizziness--73

Dupuytren's Contracture--82 and 34

Dysmenorrhea--For rapid, lasting relief of painful menstruation:
after a pure water douche, use 57 over and under uterus; leave
running after pain disappears.

When cause is uterine infection: 74, 11 + 16, 14, 17, 20, 28

Dyspepsia (indigestion)--11, 14, 16, 17, 20

Ears--various maladies--discharges, vertigo, ringing, hearing
loss--65, 14, 17, 20, 58

Eczema--65, 11, 16, 17, 20

Eczema in vascular and lung functional disturbances--63

Enuresis--1, 14, 17, 20, 28

Edema--87, 88, 71 and 41, 29, 104, 14, 17, 20, 28

Epicondylitis (pain in elbow)--82 and 34, 3, 40, 57

Epididymitis (inflammation of testicle area/ducts)--12, 14, 17,
20, 58

Epilepsy--1, 14, 16, 17, 20, 21, 25, 27, 42, 58

Epstein-Barr--105, 106, 18, 28, 14, 17, 20

Erysipelas (skin inflammation) caused by strep pyogenes, etc.--
106, 112, 1, 14, 17, 20, 28, 58

Erythema nosodum--63

Esophagus (congestion)--14, 17, 20

Eustachian tube inflammation--11, 14, 16, 17, 18, 20, 28

Eye inflammation (on left and right temples)--82 and 46

Eye Disorders (blurred, cataracts, crossed, diplopia, infected,
etc.)-- 10, 1, 14, 17, 20, 58

Eyes (Glaucoma)--10, 14, 17, 20
Facial paralysis--1, 14, 17, 20, etc.
Fatigue--4, 9, 105, 106, 28, 42, 45, 48, 56, 58, 29 + 86
Fever (various causes)--14, 17, 20, 58
Fibroma -- 7, 8, 20, 22, 24 (secondary: 11, 16, 28)

Fibrosis of lung--56 and 37 and 30 on chest
Fistula, Ulcer--14, 15, 17, 20
Flashes, hot (complications)--1, 14, 17, 20
Flatulence (intestinal gas)--11, 14, 16, 17, 19, 20, 28
Flu--11, 14, 16, 17, 20, 58
Foot--blisters--1, 14, 17, 20, 28
Fractures--37 and 36, 1, 14, 17, 20
Frostbite--14, 17, 20
Frozen shoulder--1, 14, 16, 17, 20
Fungal infection--28, 11, 14, 16, 20, 58
Furunkulosis herpes, skin diseases--38 and 13, 11, 16, 112;
secondary 17, 20
Gall bladder dystonia with osteitis--79, 3, 14, 17, 20, 58
Gallstones--79, 3, 14, 17, 20, 58
Gangrene--14, 17, 20, 58, 47
Gas (intestinal)--11, 14, 16, 17, 19, 20, 28
Gastritis and flatus--14, 15, 17, 20, 58
Gout--63, 3, 14, 17, 20, 58
Gravel in urine--79, 3, 14, 17, 20, 58
Gums (inflammation, gingivitis, pyorrhea)--11, 14, 16, 17, 20,
28, 58
Hair loss (alopecia)--1, 14, 17, 20, 28, 88
Hallucinations--1, 14, 17, 20, 58
Hangover--1, 87, 88
Hay Fever (only on some types)--14, 17, 20, 58
Headaches--Best freq. for very rapid relief of symptoms--#40

applied near hairline. Continue for 10 min. or until pain disappears; then massage scalp in CW direction. Nevertheless, if headaches persist despite elimination of all possible causes, check the possibility of tumor. For headaches of unknown cause or toxins--61, 71, 87, 88, 74, 3, 20, 41, 42, 45, 48, 58, 61, 73, 80, 29, 23, 14, 17, 25, 26, 27, 3, 105, 106, 108, 109, 114

For headaches caused by parasites--40, 42, 45, 47, 58, 20, 3

Headaches: urogenitaliy caused--40, 63, 3, 108, 109, 114

Headaches caused by vertebral misalignment-(not a substitute for chiropractic adjustment)--40, 62, 3

Head Injuries (seek immediate medical attention)--40, 62, 3, 14, 17, 20, 87, 48, 73, 74

Hearing problems--1, 11 + 16, 14, 17, 19, 20, 58

Heart (lab animals only) (see Pericarditis)--46, 40, 58, 47, 75, 1, 14, 17, 20, 28, 42, 45, 58

Heartburn--15, 4, 6, 7, 9, 10, 11 + 16, 12, 14, 17, 20, 23, 28, 29 + 86, 42, 45, 48, 58

Hemorrhage (uncontrolled bleeding)--11, 16

Hemorrhoids--11, 14, 16, 20

Hepatitis (generic---placement is over and behind liver)--82 and 55, 11, 14, 16, 20

Hernia--1, 17, 20

Herpes (zoster)--4, 6, 9, 10, 12, 11, 16, 86 and (secondary) 14, 17, 20, 58

High blood pressure, hypertension--1, 14, 17, 20, 65

Hip Pain (as in coxarthrititis)--3, 14, 17, 20, 40, 57

Hives (Urticaria)--9, 14, 17, 20, 87, 88, 74

Hoarseness--14, 19, 20

Hyperacidity of stomach--68 on solar plexus and 36 on stomach

Hydrocele (fluid in testicle, etc)--14, 17, 20

Hyperosmia (taste--morbid)--58, 1, 87, 88, 124

Hyperthyroid--78 and 85

Hypoacidity of stomach--111, 58 over & behind pancreas

Hypothyroid (Thyroid deficiency)--60 behind head, and 54 on thyroid

Hypertension--58, 45, 65, 72, 1, 14, 17, 20,

Some other varieties of hypertension: (kidney-induced, red-high, diastolic high pressure)--65 and 72

Hypertension, spastic--45

Impotence (many causes)--63, 7, 8, 28, 14, 16, 17, 20 + 22 + 24, 42, 45, 47, 48, 58, 25 + 26 + 27

Indigestion--1, 14, 17, 20, 28, 29, 58, 42, 45, 48, 74

Infantile Paralysis--12, 14, 17, 20

Infections (many classes)--10, 11, 12, 14, 15, 16, 17, 18, 19, 20, 21, 22, 24, 25, 26, 27, 28, 29, 42, 45, 48, 58, 86, 101, 103, 104, 105, 106

Infertility--7, 8, 28, 14, 16, 17, 20 + 22 + 24, 25 + 26 + 27,

63

Inflammation--81

Influenza (flu viruses mutate frequently; these codes are only a partial list)--11, 16, 12, 14, 17, 20, 58

Insomnia--76, 78, 11, 12, 14 and 16

Intercostal neuralgia (pain in rib musculature)--3, 40, 57, 11, 14, 16, 17, 18, 20, 42, 58, 86, 29

Intermittent claudication (behind the head)--52 and 50

Itching (Pruritis)--14, 17, 20, 28, 29, 42, 45, 48, 58, 29 + 86, 112

Jaundice (liver)--10, 11, 12, 14, 16, 25, 26, 27, 29 + 86, 88, 34, 42, 45, 48, 58

Kidney insufficiency (many viruses and toxins cause this)--61 and 53, 104, 10, 11, 12, 14, 16, 17, 20, 25, 26, 27, 28, 47, 53,

61, 29 + 86, 87, 88, 34, 41, 42, 45, 48, 58, 108, 109, 114

Knee/Joint pain--3, 40, 57, 11, 14, 16, 17, 20, 55, 58, 69, 78, 82, 34, 82, 62, 63

Larynx--104, 28, 29, 11, 14, 16, 17, 20, 55, 69, 78, 82, 34, 82, 62, 63

Leprosy (more below)--27

for infection of lesions: 10, 11, 12, 14, 15, 16, 17, 18, 19, 20, 21, 22, 24, 25, 26, 27, 28, 29, 58, 101, 103, 104 to 106

Leukemia--7, 8, 14, 17, 20, 22, 24, 107

Leukodermia--14, 17, 20, 29, 58, 107, 112

Locomotor Dysfunction (slow results if nerve damage exists)

incoordination--1, 14, 17, 18, 20, 25, 26, 27, 29 + 86, 42, 45, 48, 58 convulsions, spasticity--65, 67, 69

Low Blood Pressure, hypotension--14, 17, 20, 58

Lumbago--1, 14, 17, 20, 42, 45, 48, 29 + 86, 65, 67, 69

Lungs--11, 16, 14, 17, 18, 20, 42, 45, 48, 58, 29 + 86, 103, 107

Lupus Erythematosus--14, 17, 20, 18, 102

Luxation (dislocation of organs or joints)--66 and 43

Lymph stasis--71 and 41, 80, 20, 87, 88, 29, 105, 14, 17

Malaria--108

Measles (all)--109

Mental Disorders (toxins usually the cause)--29, 41, 58, 71, 80, 87 88, 1, 42, 45, 48, 74, 20, 105, 29, 11 to 28

Menieres Disease--11 + 16, 14, 17, 20, 28, 105, 107, 109

Meningitis--11 + 16, 14, 15, 17, 20, 25, 26, 27, 28, 29 + 86, 42, 45, 48, 58, 105, 106

Menstrual problems-- plain water douche first, then #57 applied above and behind uterus until pain disappears.

Other frequencies--3, 14, 17, 20, 28, 40, 58

Migraine--40 and 61, usually applied near hairline.

Motion Sickness--25, 26, 27, 28, 29 # 86, 87, 88, 42, 45, 48,

58

Mouth--eruptions; white patches (precancerous, leukoplakia)--28,
7, 8, 20, 22, 24

herpes sores-- 5, 9, 28, 11, 12, 14, 17, 20, 102, 105

Mucous membrane inflammation--31

Multiple Sclerosis--use "Autoimmune" frequencies plus 14, 17,
20

Muscles, to relax (myospasms)--19 and 70

Muscular Dystrophy (suggested)--1, 11 + 16, 14, 17, 18, 20, 25,
26, 27, 28, 34, 55, 58, 62, 63 69, 78, 87, 88, 102, 87, 88, 108,
109, 114

Muscular pain (reported as applied to the focus of injury or
pain for short periods, from 30 seconds to 3 minutes, depending
on need)--3, 57, 40, 33, 34, 35, 46, 53, 61, 73, 80, 81, 82, 84,
85

Muscle pain from parasites--29 + 86, 42, 445, 48, 58

Mumps--1, 20, 4, 5, 7, 8, 110, 105, 14, 17, 20, 58

Nausea--14, 15, 17, 20, 58, 74

Nephritis\nephrosis--14, 17, 20, 61, 53, 47 and 28

Nervousness, from geopathic netzgitter zones, drugs, Prozac
agitation (akathisia)-- 78

Nerve disorders--1, 4, 5, 6, 9, 10, 11 + 16, 14, 17, 41, 71, 80,
87, 88, 20, 25, 26, 27, 42, 45, 48, 58, 105, 106, 109

Neuralgia--75, 108, 109, 114. Sometimes frequencies for nerves
above.

Neurosis--55

Nose--infection, congestion--11 + 16, 14, 17, 18, 20, 29, 104,
28, 58 Numbness--1, 4, 5, 6, 9, 10, 11 + 16, 14, 17, 20, 25, 26,
27, 104, 106, 109

Oral Lesions--4, 5, 8, 9, 10, 11 + 16, 14, 17, 18, 19, 20, 28,
29, 87, 88, 108, 109, 114

Orchitis (Inflammation of testes due to TB, mumps, gonorrhea, cancer, etc.)--4, 5, 6, 7, 8, 9, 10, 11 + 16, 12, 14, 15, 17, 18, 20 + 22 + 24, 25, 26, 27, 42, 45, 48, 58, and 110

Osteomyelitis (bone infection)--79, 4, 5, 6, 7, 8, 9, 10, 11 + 16, 12, 14, 15, 17, 18, 20 + 22 + 24

Osteomalacia--full body sunbathing (stop before skin reddens)

Otosclerosis (type of deafness)--65

Ovarian disorders--25 + 26 + 27, 28, 29, 57, 4, 5, 6, 7, 8, 9, 10, 11 + 16, 12, 14, 15, 17, 18, 20 + 22 + 24, 58

Pain (look under appropriate affliction for more)--3, 45, 40, 57

Pain of infection--3, 40, 57, 45, 14, 11 + 16, 17, 18, 20, 74

Pain of cancer--3, 40, 57, 45, 7, 8, 20 + 22 + 24

Pancreatic insufficiency--111, 61 over pancreas and 34 under (behind?) pancreas,--(secondary)--25 + 26 + 27, 28, 29, 57, 4, 5, 6, 7, 8, 9, 10, 11 + 16, 12, 14, 15, 17, 18, 20 + 22 + 24, 58

Paralysis, spastic (slow results in some cases)--1, 14, 17, 18, 20, 25, 26, 27, 29 + 86, 42, 45, 48, 58, 69

Paralysis, nonspastic (langorous) (slow results in some cases)--1, 14, 17, 18, 20, 25, 26, 27, 29 + 86, 42, 45, 48, 58, 65, 67

Parasites--42, 45, 48, 58, 29 + 86

Pelvic Inflammatory Disease (PID)--4, 5, 6, 7, 8, 9, 10, 11 + 16, 17, 18, 20 + 22 + 24, 25, 26, 27, 28, 29 + 87, 45, 48, 103, 105, 110, 107, 118

Pericarditis--4, 6, 10, 14, 11 + 16, 17, 19, 20, 26, 28, 40, 42, 47, 57, 58, 75, 45, 46, 47, 48, 29 + 86

Pharyngitis--104, 107, 31, 10, 11 + 16, 18, 17, 14, 20, 58, 87 88,

Pleurisy--11, 16, 14, 17, 18, 20, 42, 45, 48, 58, 29 + 86, 103, 107

Pneumonia--11, 16, 14, 17, 18, 20, 58, 103, 107

Poliomyelitis--121,

secondary complications--11 + 16, 105, 12, 14, 17, 20

Polyps--4, 5, 6, 7, 8, 9, 10, 20 + 22 + 24, 25 + 26 + 27, 28, 29, 58, 87, 88

Pre-op and post-operation--prevention and control of nosocomial (hospital-acquired) and idiopathic infection--6, 9, 10, 11 + 16, 12, 14, 15, 16, 17, 18, 20, 28, 29, 87, 88, 105, 107, 109

Prostatitis, benign prostate tumor--44 and 30, 87, 88, 4, 5, 6, 7, 8, 11 + 16, 17, 18, 20 + 22 + 24, 28, 42, 45, 48, 58, 29 + 87

Prostate complaints--63, 7, 8, 20, 22, 24, 28, 14, 16, 17, 20, 42, 45, 47, 48, 58

Proritis (itching)--14, 17, 20, 28, 29, 42, 45, 48, 58, 29 + 86, 112

Prostate tumor (malignant) one electrode against navel, other against rectum--7, 8, 20 + 22 + 24

Psychosomatic pain (viral, energetic meridian blocks, toxicity, nutritional)--20, 40, 57, 41, 44 + 32, 87, 88, 108, 109, 114

Pyorrhea (periodontal disease: jawbone infection; receding gums)--4, 5, 8, 9, 10, 11 + 16, 14, 17, 18, 20, 28, 29, 87, 88

The electrodes are placed so the infection lies on a straight line between them.

Rabies--122

Raynaud's Disease (cold hands & feet)--20, 58

Rheumatoid arthritis of the muscles and tendons--82 and 34, 62, 63, 25 + 26 + 27, 1, 11 + 16, 14, 17, 20, 55, 58, 69, 78, 82

Rhinitis or Runny nose--1, 11 + 16, 12, 14, 17, 18, 20, 29, 58, 87, 88, 28

Sarcoma--7, 8, 14, 17, 20, 22, 24, 107

Scars--59 + 11 to 28

Scarlet Fever--14, 17, 20, 22 + 24

Sciatica or Ischia

(severe cases require direct application of electrodes over and behind the afflicted area at a high intensity)--
11 + 16, 14, 17, 20, 22, 24, 61

Sedative Effect (reported use on bleeding, bruises, insomnia, sinusitis (also reported use on lymph stasis/edema, auricular treatment)--80

Sexual Dysfunction--63, 7, 8, 28, 14, 16, 17, 20 + 22 + 24, 42, 45, 47, 48, 58, 25 + 26 + 27

Shingles #Herpes Zoster--11 + 16, 9, 86 (secondary) 14, 17, 20, 57

Sinusitis--11 + 16, 14, 17, 20, 42, 48, 87

Sleeping Sickness--124

Slipped discs (includes spasms from microbial toxins)--57 (BEST), 42, 14, 17, 109, 17, 20, 45, 48, 87, 88, 108, 109, 114

Smallpox--125 plus 11, 16, and (secondary) 14, 17, 20

Sneezing--14, 17, 20, 28, 88

Sore Throat (pharyngitis) (consider also food allergies)--4, 5, 9, 10, 11 + 16, 14, 17, 18, 20, 28, 107, 123

Spasms, muscle--70

Spastic paresis--25, 26, 95 and 50

Spleen, enlarged--54 and 17

plus secondary--1, 4, 6, 9, 11, 14, 16, 20, 28, 58

Spondylitis, acute--82 and 61, or 69 and 55 on the focus

Staphylococci infection--20

Stiff neck--74

Spastic stiff neck--65 and 72

Stiff muscles in general--33, 34, 35, 40, 42, 46, 53, 58, 61, 73, 80, 81, 82, 84, 85, 9, 11 + 16, 14, 17, 18, 20

Stomach disorders--7, 8, 14, 17, 20, 20 + 22 + 24, 42, 45, 48, 58, 75, 103, 118, 119

Stones--77

Streptococci infection--14

Streptothrix infection--17

Sty--1, 14, 17, 20, 58

Subluxation induced disorders--62

Sun Allergy (consider also that prescription drugs, such as Psoralen, often produce a "sun allergy" due to phototoxic effects on the liver)-- 78 and 32

Sunstroke--29, 105, 39, 3, 45, 87, 88, 14, 58

Surgery--Prevention and control of nosocomial (hospital-acquired) and idiopathic infection--6, 9, 10, 11 + 16, 12, 14, 15, 16, 17, 18, 20, 28, 29, 87, 88, 105, 107, 109 surgical pain, post-op recovery-- 3, 45, 40, 57, 44 + 32

Swelling (Edema)--87, 88, 71 and 41, 29, 105, 14, 17, 20

Swollen glands--14, 17, 20, 58, etc.

Syphilis--25 + 26 + 27

Tachycardia (also used for pain of arthritis, headache, Tui-na, and facial toning)--82

Teeth (pain) Also see Pyorrhea.

~~This can prevent recovery from other illnesses: 3, 45, 39, 51, 10, 11 + 16, 12, 14, 1, 5, 17, 18, 19, 20, 24 + 25 + 27, 28, 4, 5, 9~~

Tendomyopathy (applied to the focus of injury or pain for short periods, from 12 seconds to 3 minutes, depending on need)--3, 33, 34, 40, 46, 53, 57, 58, 61, 73, 80, 81, 82, 84, 85, 87, 88

Tetanus--125, 27

(for secondary complications)--14, 17, 20

Thrush (aphtha, sprue, stomatitis)--28

Tonsillitis--82 and 47, 11 + 16, 12, 14, 15, 17, 18, 20, 25 + 26 + 27, 28, 123, 107

Toothache (see Appendix) (hidden dental and jaw infection or foci will prevent recovery from ANY illness)--3, 45, 39, 51, 4, 5, 9, 10, 11 + 16, 12, 14, 15, 17, 18, 20, 24, 25, 27, 28, 87,

88, 108, 109, 114

Tooth extraction, afterward--3, 45, 51, 68

Toxins--29, 41, 87, 88, 108, 109, 114. 1, 14, 17, 20, 42, 45, 48, 58

Trauma--3, 45, 39, 19, 14, 17, 20, 28

Trench Mouth--25 + 26 + 27

secondary complications--14, 17, 18, 20, 25, 26, 28

Trigeminal neuralgia--4, 5, 6, 9, 10, 11 + 16, 14, 15, 17, 18, 19, 20, 25, 88, 68, 56, 105 to 107, 109, 114, 116, 112, 121, 122, 125, 124

Tuberculosis--11 + 16, 20 + 22 + 24

secondary complications--18, 7, 8, 28, 107

Typhoid--118, 119, 11 + 16, 22, 9

Ulcers--5, 6, 7, 9, 10, 14, 15, 16, 17, 18, 20, then 82 and 47

Urethritis--4, 6, 7, 9, 10, 11 + 16, 12, 14, 15, 17, 18, 20, 25 + 26 + 27, 28, 29 + 86, 42, 45, 48, 82

Urticaria (Hives)--(often due to parasite toxins: condition becomes worse until all toxins are excreted)--9, 29, 42, 45, 48, 87, 88, 17, 20, 71

Varicoses--82 and 55

Vegetative Dystonia (involuntary muscle dysfunction)--53

Vein thrombosis (blood clot)--23

Vertigo, giddiness of unknown cause--49 and 73

Warts--4, 5, 6, 7, 8, 9, 10, 12, 20 + 22 + 24

Worms (see note under parasites)--42, 45, 48, 58, 29 + 86

Wound healing--14, 17, 20, 37, 39, 58

Wound healing, Delayed--53 (plus those above)

Yeast infection (Candida albicans, etc.)--28

Yellow Fever--114

MISCELLANEOUS NUMBERS

Requiring special training (acupuncture, aesthetology, biophysics, etc.)

SCHUMANN FREQUENCY, used for entraining the brain in psychic healing experiments, and to scan brain for troubled areas--68

For RELAXATION, MEDITATION AND DEEPER SLEEP--74

To stimulate MENTAL CLARITY--60

Facial toning--62

Kidney meridian (balancing/correction)--65

German and Russian studies have discovered a very high statistical correlation between the personalities of individuals and the position of planets at the time of their birth.

Dr. Sieger believes this is due to the effect of gravitational interference fields. Two frequency patterns which correlate with the fields in that time frame are:

Sagittarius--close to 17, and 38

Capricorn and Aquarius--37

As noted above, the table sets forth certain codes or channels that are representative of precise frequency signals in cycles per second (Hz).

The precise frequency signals represented by such channels are set forth in the table below which also sets forth the minimum time in seconds that the precise frequency signal is gated ON between one second periods that the frequency signal is gated OFF.

CODE	FREQUENCY	GATE
Auto 1		0
1	10,000	0
2	1050	0
3	3040	0
4	2720	0
5	2489	0
6	2170	0
7	2127	0

33

8	2008	0
9	1800	0
10	1600	0
11	1550	0
12	1500	0
13	1000	0
14	880	0
15	832	0
16	802	0
17	787	0
18	776	0
19	760	0
20	727	0
21	700	0
22	690	0
23	685	0
24	666	0
25	650	0
26	625	0
27	600	0
28	465	0
29	444	0
30	410	3
31	380	3
32	330	3
33	320	3
34	250	3
35	240	3
36	230	3
37	220	3
38	200	3
39	190	3

34

40	160	3
41	148	3
42	125	3
43	110	3
44	100	3
45	95	3
46	80	3
47	73	3
48	72	3
49	60	3
50	48	3
51	47.5	3
CODE	FREQUENCY	GATE
52	45	3
53	40	3
54	35	3
55	28	3
56	27.5	3
57	26	3
58	20	3
59	18	3
60	12	3
61	10	3
62	9.6	3
63	9.4	3
64	9.35	3
65	9.2	3
66	9.1	3
67	8.25	3
68	7.83	3
69	7.7	3
70	6.8	3

35

71	6.3	3
72	6.0	3
73	5.8	3
74	4.9	3
75	3.9	3
76	3.6	3
77	3.5	3
78	3.0	3
79	2.65	3
80	2.5	3
81	1.5	3
82	1.2	3
83	1.1	3
84	1.0	3
85	.5	3
86	1865	0
87	522	3
88	146	3
89	610	3
90	2005	0
91	2025	0
92	.6	0
93	.75	3
94	.4	3
95	30.87	3
96	32.7	3
97	36.71	3
98	41.2	3
99	43.65	3
100	49	3
101	500	0
102	1850	0

36

103	450	0
CODE	FREQUENCY	GATE
104	440	0
105	428	0
106	660	0
107	589	0
108	555	0
109	333	0
110	14	0
111	15	3
112	2000	0
114	999	0
115	.67	0
116	770+wobble	0
117	780+wobble	0
118	1570	0
119	1770	0
Auto 2	804.1	3
120	804.1	
121	805.6	3
122	807.23	3
123	808.79	3
124	810.35	3
125	811.91	3
126	813.48	3
126	815.04	3
127	816.60	3
128	818.16	3
129	819.73	3
130	821.288	3
Auto 3	822.75	
131	822.75	

37

132	824.22
133	825.69
134	827.16
135	828.63
136	830.10
137	831.57
138	833.04
139	834.51
140	835.98
141	837.463
Auto 4	838.85
142	838.85
143	840.24
144	841.63
145	843.02
146	844.41
147	845.80
148	847.19
149	848.58
150	849.96
151	851.35
CODE	FREQUENCY
152	852.749
153	854.07
154	855.38
155	856.71
156	858.02
157	859.34
158	860.66
159	861.98
160	863.30
161	864.62

GATE

162	865.94
163	867.254
Auto 6	868.51
164	868.51
165	869.77
166	871.02
167	872.28
168	873.53
169	874.79
170	876.04
171	877.30
172	878.55
173	879.81
174	881.07
Auto 7	882.265
175	882.265
176	883.465
177	884.664
178	885.863
179	887.063
180	888.262
181	889.461
182	890.661
183	891.860
184	893.060
185	894.259
Auto 8	895.407
186	895.407
187	896.555
188	897.703
189	898.851
190	899.999

39

191	901.147
192	902.295
193	903.443
194	904.591
195	905.739
196	906.887
Auto 9	907.989
197	907.898
198	909.091
CODE	FREQUENCY
199	910.193
200	911.295
201	912.397
202	913.499
203	914.602
204	915.704
205	916.806
206	917.908
207	919.010
Auto 10	920.071
208	920.071
209	921.132
210	922.192
211	923.253
212	924.314
213	925.374
214	926.435
215	927.496
216	928.556
217	929.617
218	930.677
Auto 11	960.211

GATE

40

219	960.211
220	989.744
221	1019.27
222	1048.81
223	1078.34
224	1107.88
225	1137.41
226	1166.94
227	1196.48
228	1226.01
229	1255.54
230	1285.08
231	1314.61
232	1344.14
233	1373.68
234	1403.21
235	1432.74
236	1462.28
237	1491.81
238	1521.34
239	1550.88
240	1580.41
241	1609.94
242	1639.48
243	1669.01
244	1698.54
245	1728.08
246	1757.61
247	1787.14
248	1816.68
CODE	FREQUENCY
Auto 12	646711

GATE

249	646711
250	647640
251	648569
252	649498
253	650427
254	651356
255	652285
256	653214
257	654143
258	655072
259	656002
260	656931
261	657859
262	658789
263	659718
264	660647
265	661576
266	662505
267	663434
268	664363
269	665292
270	666221
271	667150
272	668079
273	669009
274	669938
275	670887
276	671796
277	672725
278	673653
279	674583
Auto 13	674583

280	674583
281	675477
282	676371
283	677265
284	678159
285	679053
286	679947
287	680841
288	681735
289	682629
290	683523
291	684417
292	685311
293	686206
294	687100
295	687994
296	688888
297	689782
298	690676

CODE	FREQUENCY	GATE
299	691570	
300	692464	
301	693358	
302	694252	
303	695146	
304	696040	
305	696934	
306	697828	
307	698722	
308	699616	
309	700510	
310	701404	

Auto 14	702265
311	702265
312	703126
313	703987
314	704848
315	705709
316	706570
317	704432
318	708292
319	709153
320	710015
321	710876
322	711737
323	712598
324	713459
325	714320
326	715181
327	716042
328	716903
329	717764
330	718625
331	719486
332	720347
333	721209
334	722070
335	722931
336	723792
337	724653
338	725514
339	726375
340	727236
Auto 15	728067

341	728067	
342	728898	
343	729730	
344	730562	
345	731393	
346	732225	
347	733056	
348	733888	
CODE	FREQUENCY	GATE
349	734719	
350	735551	
351	736382	
352	737214	
353	738045	
354	738876	
355	739708	
356	740539	
357	741371	
358	742202	
359	743034	
360	743865	
361	744697	
362	745528	
363	746360	
364	747191	
365	748022	
366	748854	
367	749686	
368	750517	
369	751349	
370	752180	
Auto 16	752985	

45

371	752985	
372	753790	
373	754594	
374	755399	
375	756203	
376	757009	
377	757813	
378	758618	
379	759423	
380	760227	
381	761032	
382	761836	
383	762641	
384	763446	
385	764251	
386	765055	
387	765860	
388	766665	
389	767470	
390	768275	
391	769079	
392	769884	
393	770688	
394	771494	
395	772298	
396	773103	
397	773907	
398	774712	
399	775517	
CODE	FREQUENCY	GATE
400	776322	
Auto 17	777103	

401	777103
402	777883
403	778663
404	779444
405	780224
406	781005
407	781785
408	782565
409	783346
410	784126
411	784906
412	785687
413	786468
414	787248
415	788028
416	788809
417	789590
418	790370
419	791151
420	791931
421	792711
422	793492
423	794272
424	795053
425	795833
426	796613
427	797394
428	798175
429	798955
430	799735
Auto 18	800493
431	600493

432	801251
433	802010
434	802768
435	803526
436	804284
437	805042
438	805801
439	806559
440	807317
441	808075
442	808833
443	809592
444	810350
441	811108
446	811866
447	812624
448	813383
449	814141

CODE	FREQUENCY	GATE
450	814899	
451	815657	
452	816415	
453	817174	
454	817932	
455	818690	
456	819448	
457	820207	
458	820965	
459	821723	
460	822481	
Auto 19	823217	
461	823217	

462	823953
463	824688
464	825424
465	826160
466	826896
467	827632
468	828367
469	829103
470	829839
471	830575
472	831310
473	832046
474	832782
475	833518
476	834254
477	834989
478	835725
479	836461
480	837197
481	837932
482	838668
483	839404
484	840140
485	840876
486	841611
487	842347
488	843083
489	843819
490	844554
Auto 20	845276
491	845276
492	845997

49

493	846718	
494	847439	
495	848160	
496	848881	
497	849603	
498	850324	
499	851045	
CODE	FREQUENCY	GATE
500	851776	
501	852487	
502	853208	
503	853929	
504	854651	
505	855372	
506	856093	
507	856814	
508	857535	
509	858256	
510	858978	
511	859699	
512	860420	
513	861141	
514	861862	
515	862583	
516	863304	
517	864026	
518	864747	
519	865468	
520	866189	
521		
522		
523		

Referring now to FIGS. 5a and 5b, it will be seen that the frequency synthesizer means 12 generally includes an integrated circuit 54 provided by a Q220 DDS IC made by Qualcomm. The input data for the control word for the frequency synthesizer circuit 54 is input by means of three eight bit latches 56, 58 and 60. The 23 bit frequency control word provided by the latches 56, 58, and 60 instructs the frequency synthesizer circuit to generate a specific frequency having a frequency resolution of 0.715 Hz. on output 62. Resolution of the frequency signal thus generated is increased further by dividing it by a first Divide by 100 counter 64, a 28C64-15/L counter made by Phillips, and then by a second similar Divide by 100 counter 66. The output 68 of counter 66 is then input to a Divide by 2 flip-flop 70 in FIGS. 4a-4i to ensure a 50 % duty cycle for the resultant precise frequency output signal on output 72. The precise frequency output signal thus has a range, in the illustrated embodiment, of around 0.00004 Hz to 3Mhz.

Referring now to FIGS. 3a-3e, it will be seen that actuation of a key of the keyboard set 18 provides a particular interrupt control signal to the controller 74 where it is stored. The controller is an integrated circuit Model 74C923 made by National Semiconductor Co. The control signal stored in controller 74 is then read by the micro controller in FIGS. 4a-4i. The micro controller 16 is an Intel P80C31BH IC controller. The micro controller 16 operates through a bus controller 76, a Phillips PCF8584 controller, which has the ability to operate in both master and slave modes to communicate with the 4 digit display 21 in FIGS. 3a-3f to display information representative of the particular frequency output signal that has been chosen by a user of the system 10 or which is presently running on the system. The micro controller 76 also communicates similarly with the 4 digit display 23 in

FIGS. 3a-3e to display the time remaining for a specific frequency signal to continue to be generated and the particular pulse ON period for that specific frequency signal. The 4 digit display 23 is provided by display circuits 78 and 80 under the control of a suitable display controller 82, a Phillips SAA1064 controller. The display circuits are HDSP-A011 units made by Hewlett Packard.

The display 23 is provided by Hewlett Packard HDSP-A011 units 84,86,88, and 90 under the control of a display controller 92, a Phillips SAA1064 controller. The LED 52 and the LED 44 are activated under the control of the micro controller 16, as seen in FIG. 3. Also, in FIGS. 3a-3e it will be seen that the pulse time switch 44 of the keyboard means and the voltage control 50 of the keyboard communicate with the micro controller 16 in FIGS. 4a-4i.

Referring again to FIGS. 4a-4i, the programmable memory 14 of the system 10 is provided by a first programmable memory 94, an EPROM model NM27C512Q-150 made by National Semiconductor, and a second programmable memory 96, an EEPROM model 28C64A-15/L made by Microchip. The first programmable memory 94 stores the control signals for the preprogrammed sequences of frequency signals that may be accessed by a user actuating a particular control number or channel number that is representative of a particular sequence of frequencies. The programmable memory 96 contains control signals that may be accessed by a user when selecting a particular specific precise frequency signal or when creating a particular customized sequence of specific frequency signals for application.

A first decoder 98 and a second decoder 100 communicate with the programmable control means 14 and cooperate with a suitable digital to analog converter circuit 102 to provide analog signals to the R-C circuit 104 formed by resistance 106

and capacitor 108 to provide the one second delay between ON periods in certain specific frequency signals as heretofore described.

The circuit 110 includes the resistor 112 and the capacitor 114 and provides the soft start circuit 34 that upon commencement of a specific precise frequency signal gradually ramps up the output signal from zero to a predetermined value at a constant predetermined rate.

A speaker 116 is included in the audio circuit 118 to provide an auditory signal to a user of the system 10 upon the initiation of each specific precise frequency signal whether singly or part of a sequence. The decoder 120 provides address DEMUX and the integrated circuit 122 acts as a receiver to clean up signals received from the keyboard to preclude erroneous signals from key bounce for example. Reference character 124 refers to an integrated circuit that provides multiplexing of the data bus for the particular integrated circuits chosen for implementation of the system 10. The circuit generally designated by 126 controls the slew rate of the pulses. A suitable user port 128 is provided for further applications of the amplified output signal beyond the particular spaced electrode means illustrated in the previously described Figures.

Referring now to FIG. 7, the output circuit 22 is illustrated. A transformer coupled inverter 130 generates around 100 V DC. Isolation of the output is accomplished by means of the transformer 17 and optically coupling signals to the output circuit which includes the emitter follower 132 and the output capacitor 134. The specific precise frequency signal including such OFF intervals as may be interposed appears on lead 136 and is optically coupled to the emitter follower 132 for control thereof. The output level of the amplified frequency signal is determined by the control signal 138

established by the intensity control 50 and for present purposes may be considered not to exceed a level of around 50 volts. The control signal 138 controls a series pass transistor 140.

FIG. 8 illustrates the security circuit 22 and includes a normally open reed relay 142 that is configured in such a manner so as to detect any opening of the enclosure 26. Any momentary contact of the relay 142 causes a flip-flop 143 to be set to Low when tripped. A Low signal for the flip-flop 144 is directed to

the micro controller 16 to disable the system 10 until the system is reset by an authorized party.

FIGS. 6a and 6b illustrate the power supply 40 which supplies power to all components of the system 10. The power supply is a conventional buck converter capable of operation from 7 to 20 V DC or AC. The voltage VCC appears on lead 146 and is +5 V. FIG. 6b is a further depiction of charging capacitors to maintain VCC during usage.

DETAILED DESCRIPTION OF THE SECOND PREFERRED EMBODIMENT

Referring now to FIG. 15 which depicts a block diagram of the second preferred embodiment and FIG. 16, this embodiment differs from the first preferred embodiment by adding one or more removable plug in modules 144-144B, see FIGs. 16 and 17, in place of one hard wired module 14 of FIG. 4b for selective replacement with pre-approved frequencies for various different uses according to the governmental laws of the country in which this invention is to be used, i.e. as for example those frequencies approved by the FDA for specific food processing purposes. Each plug-in modules 144 has different frequency ranges and different specific frequencies, as for example one module could produce FDA approved frequencies for specific meat processing, other modules could produce FDA approved frequencies for sanitation of food processing areas, for killing of bacteria, or other germs or the like. It should be understood that any different frequencies can be programmed into as many

different specific modules as required to satisfy the specific use requirement. The individual replaceable modules 144 can be updated or new replacement modules added to accommodate additional approved frequencies as they become approved for the same purpose the module was originally intended use.

A second difference between the two embodiments is that in the second embodiment there is an output circuit 146 which has an output port or connector 147 with a specific selected frequency are present rather than wire connectors from the output connected to the patient. In the second embodiment an external transmission circuit 148 is attached which communicates the frequency from the output to one or more patients by a wireless connection. The external means could be an RF transmitter or the like transmitting to a receiver 150 connected to the patient or patients which provides the required level of voltage of the output frequency to the patients or patients.

Any convenient means for transmitting the frequency to the patient or patients in a wireless manner can be utilized for the purpose of examples and not by way of limitation, RF transmitter and receiver, infra red, sonic or the like may be used or any other means suitable for the purpose intend.

From the foregoing, it is apparent that the present invention provides a novel system and method for generating a plurality of specific precise bio-active frequencies and

sequences of such frequencies for appropriate applications such as health science, industrial and other commercial uses. The term "health science applications" should be considered broadly and not limiting as the bio-active frequency generator of the present invention may also be used for such applications as destroying micro-organisms such as are found in food, food handling areas, water supplies and in various oil supplies.

Changes may be made in the combination and arrangement of parts or elements as heretofore set forth in the specification and shown in the drawings, it being understood that changes may be made in the precise embodiment disclosed without departing from the spirit and scope of the invention as defined in the following claims.

What is claimed is:

CLAIMS:

1. A system to generate an output signal having a predetermined precise single frequency or a precise plurality of different frequencies in series and particularly adapted for use in applications including health science and industrial uses, comprising:

a micro controller;

a frequency generation means for generating a frequency range of 0.00004 Hz to 3Mhz;

a plurality of different purpose replaceable control memories any one of which can be selected for use in said system, one of said replaceable memories is selected for use in said system depending on said precise single frequency desired or a desired sequential series of different frequencies at the output of said system, each one of said plurality of said control memories when installed in said system provides an input to said micro-controller for controlling said frequency generation means interconnected thereto for generating said specific frequency or the series sequence of frequencies contained in said installed control memory;

frequency generating means responsive to said micro-computer for generating a desired output signal having said precise frequency or series sequences of different frequencies;

keyboard means coupled to said micro controller and actuable to generate a control signal from said installed memory

representative of a predetermined frequency or series of predetermined frequencies;

display means coupled to said micro controller for displaying information representative of actuation of the keyboard means and the output signal; and

an output circuit connected to said micro controller for receiving said predetermined frequency or predetermined series of frequencies and providing a voltage output signal at said specific precise frequency selected for use in health science and food processing industry.

2. The system as defined in claim 1 wherein said installed replaceable installed memory limits the output frequency of said frequency generating means to those frequencies approved by the FDA for their intended use in health science or the food processing industry.

3. The system as defined in claim 1 wherein the frequency of the output signal is accurate to at least 0.001Hz..

4. The system as defined in claim 1 wherein the frequency generation means includes a frequency synthesizer means, and

said installed replaceable control memory is coupled to the micro controller means whereby actuation of the micro controller whereby actuation of the keyboard means generates a signal representative of a predetermined frequency selected from said installed replaceable control memory for application to the

frequency synthesizer means to cause such frequency synthesizer means to generate the selected predetermined precise frequency.

5. The system as defined in claim 4 wherein the shape of the output signal is a square wave having a 50% duty cycle.

6. The system as defined in claim 5 wherein the keyboard means is actuable to store within said installed memory instructions representative of a sequence of predetermined precise frequencies whereby a number of frequencies can be generated serially upon command.

7. The system as defined in claim 6 wherein at least one set of instructions that is representative of a predetermined series of predetermined frequency output signals is stored within the installed replaceable whereby actuation of the keyboard means selects a specific set of instructions from said installed memory via said micro controller for application to the frequency synthesizer means for generation of an output signal having a series of predetermined frequencies.

8. The system as defined in claim 5 wherein a plurality of sets of instructions that are representative of a predetermined series of predetermined frequency output signals are stored within said micro processor whereby actuation of the keyboard means via said micro processor selects a particular set of instructions stored in said micro processor for application to the frequency synthesizer means for generation of a selected

output signal having a series of predetermined frequencies.

9. The system as defined in claim 1 wherein the output means further includes amplifier circuit means that amplifies the output signal to increase the amplitude of the output signal from zero to its ultimate amplitude at a predetermined rate.

10. The system as defined in claim 9 wherein the keyboard means is actuable to provide a control signal from said micro processor to the output means to control the amplitude of the voltage of the output signal.

11. The system as defined in claim 6 wherein the system further includes an audio means that is responsive to the termination of a frequency signal in an output signal to create an audible signal prior to initiation of an immediately succeeding frequency signal in the output signal.

12. The system as defined in claim 1 further comprising a gating means that gates the generated precise frequency signal ON and OFF for predetermined periods of time, is controllable by manual actuation of the keyboard means.

13. The system as defined in claim 12 wherein the gating means is variable to vary the gated periods of time.

14. The system as defined in claim 12 wherein the gating means is variable to gate the generated precise frequency signal OFF for a period of at least one second and to gate such frequency signal ON for a period exceeding one second.

15. The system as defined in claim 12 wherein the gating means is variable to gate the generated precise frequency signal OFF for a predetermined time period and to gate such frequency signal ON for a period from about one to seven seconds.

16. The system as defined in claim 15 wherein the information displayed by the display means includes a representation of the particular precise frequency signal then being generated by the frequency generation means and the specific ON period then being interposed between OFF periods for such signal by the variable gating means.

17. The system as defined in claim 15 wherein the information being displayed by the display means further includes a representation of the time remaining of a preprogrammed time period for a specific precise frequency signal be generated by the frequency signal generating means.

18. The system as defined in claim 1 further comprises said application means comprising electrode means for applications including health science and industrial uses.

19. The system as defined in claim 18 wherein the electrode means includes a pair of electrically conductive elements adapted to be held in the hands of a user of the system.

20. A system to generate an output signal having a predetermined precise frequency and particularly adapted for use

in applications including health science and industrial use, comprising:

means responsive to a control signal to generate an output signal having a precise frequency in the range of 0.00004 Hz to 3 MHz;

a removable control means coupled to the precise frequency generating means and operative to generate a determinable control signal selected by a user;

means responsive to the specific frequency signal generated to determine whether to selectively pulse the generated frequency signal ON and OFF in a predetermined sequence;

an output connector coupled to the precise frequency signal generating means;

application means; and

transmission means having an input connector and output connector adaptable for mating with said output connector, said transmission means comprising means for wireless communication with said application means for use in said health science and industrial uses.

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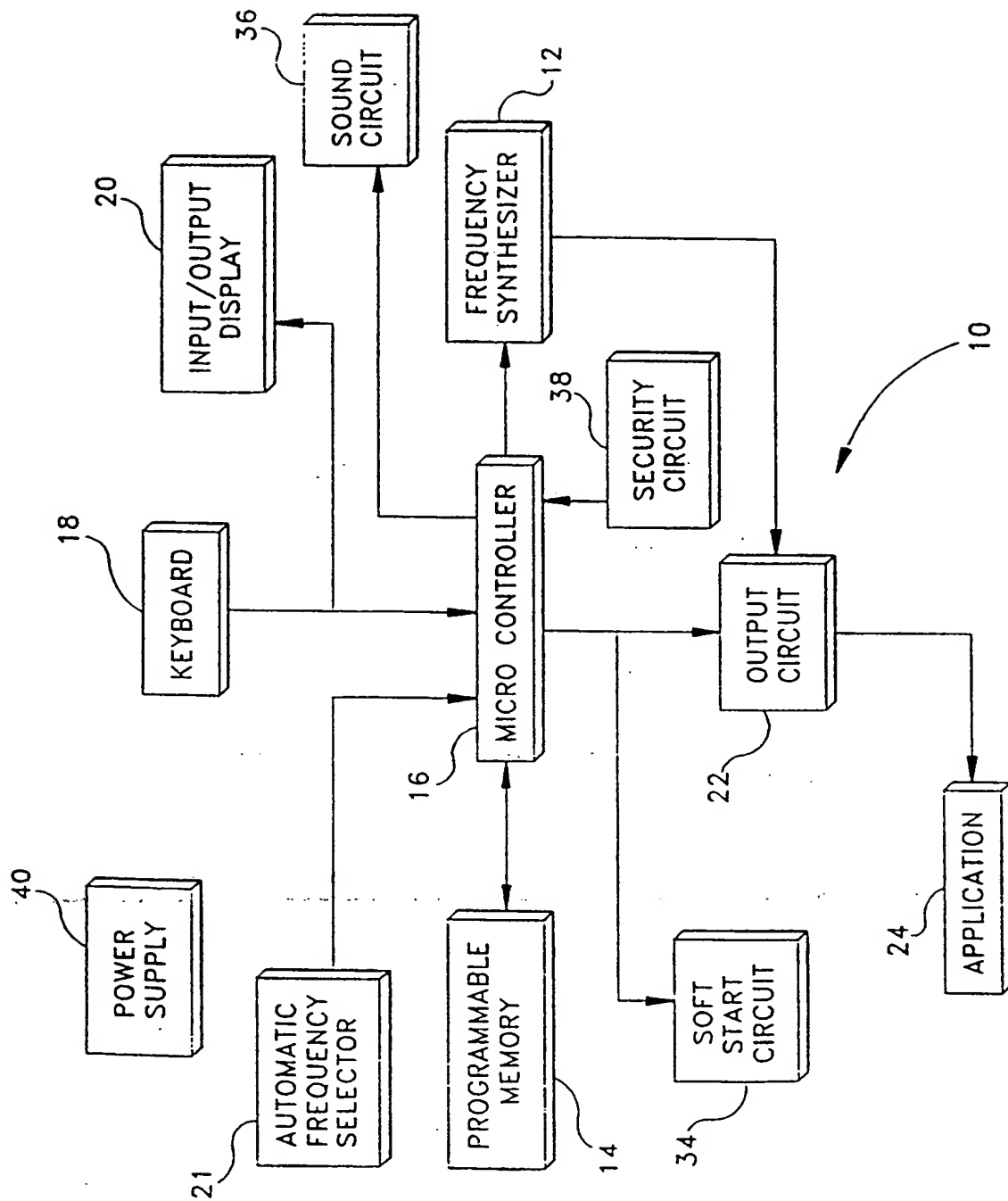


FIG. 1

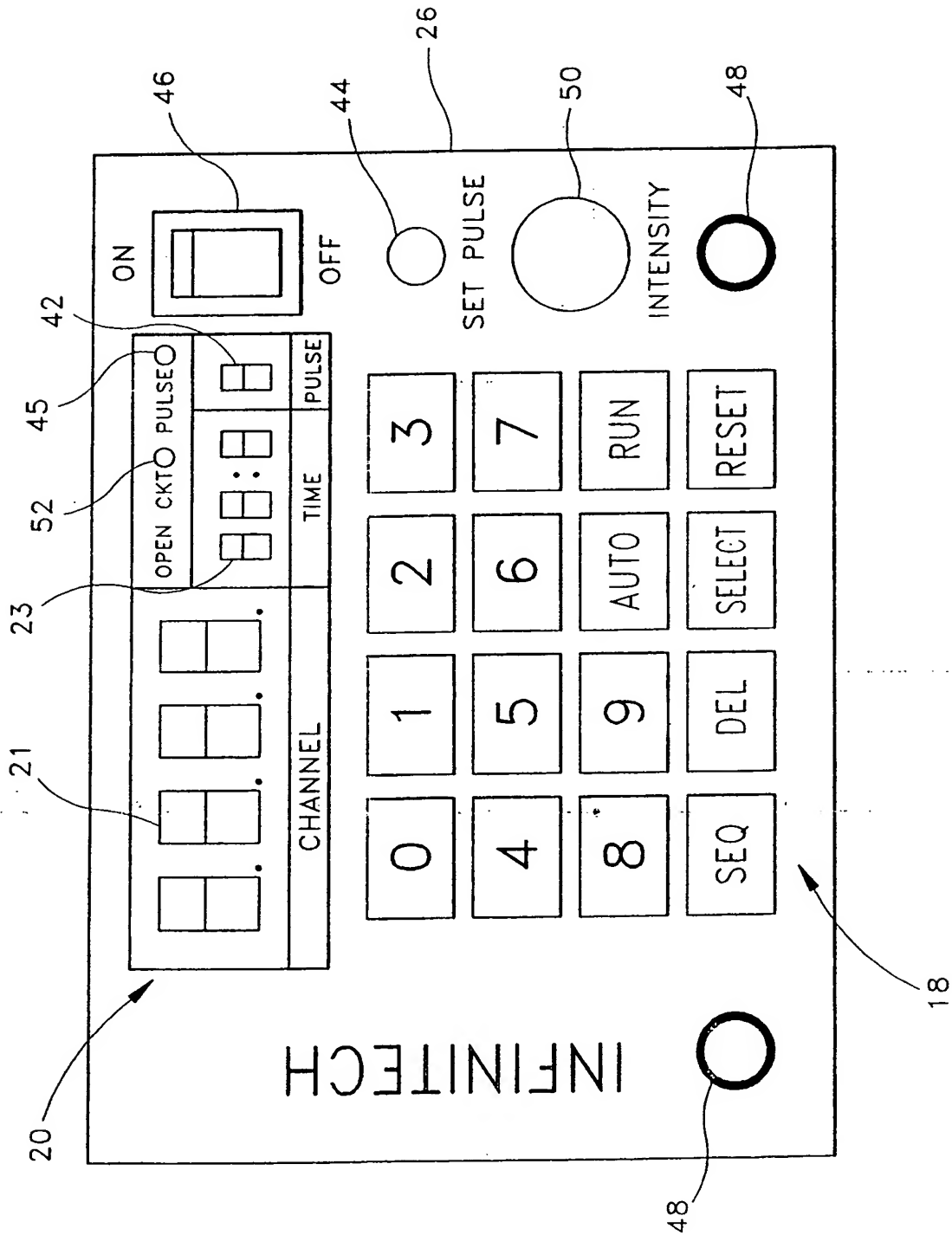
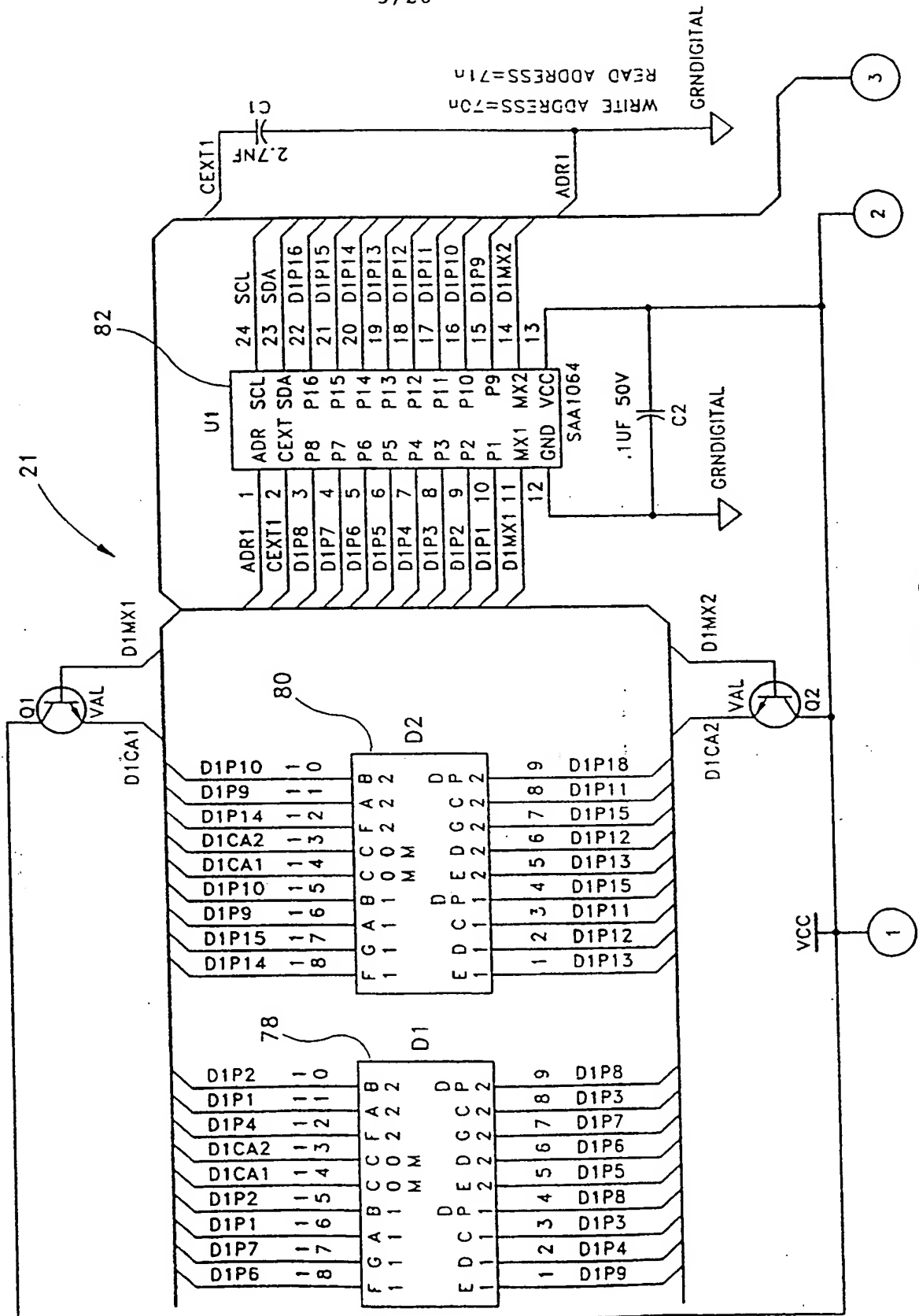


FIG. 2

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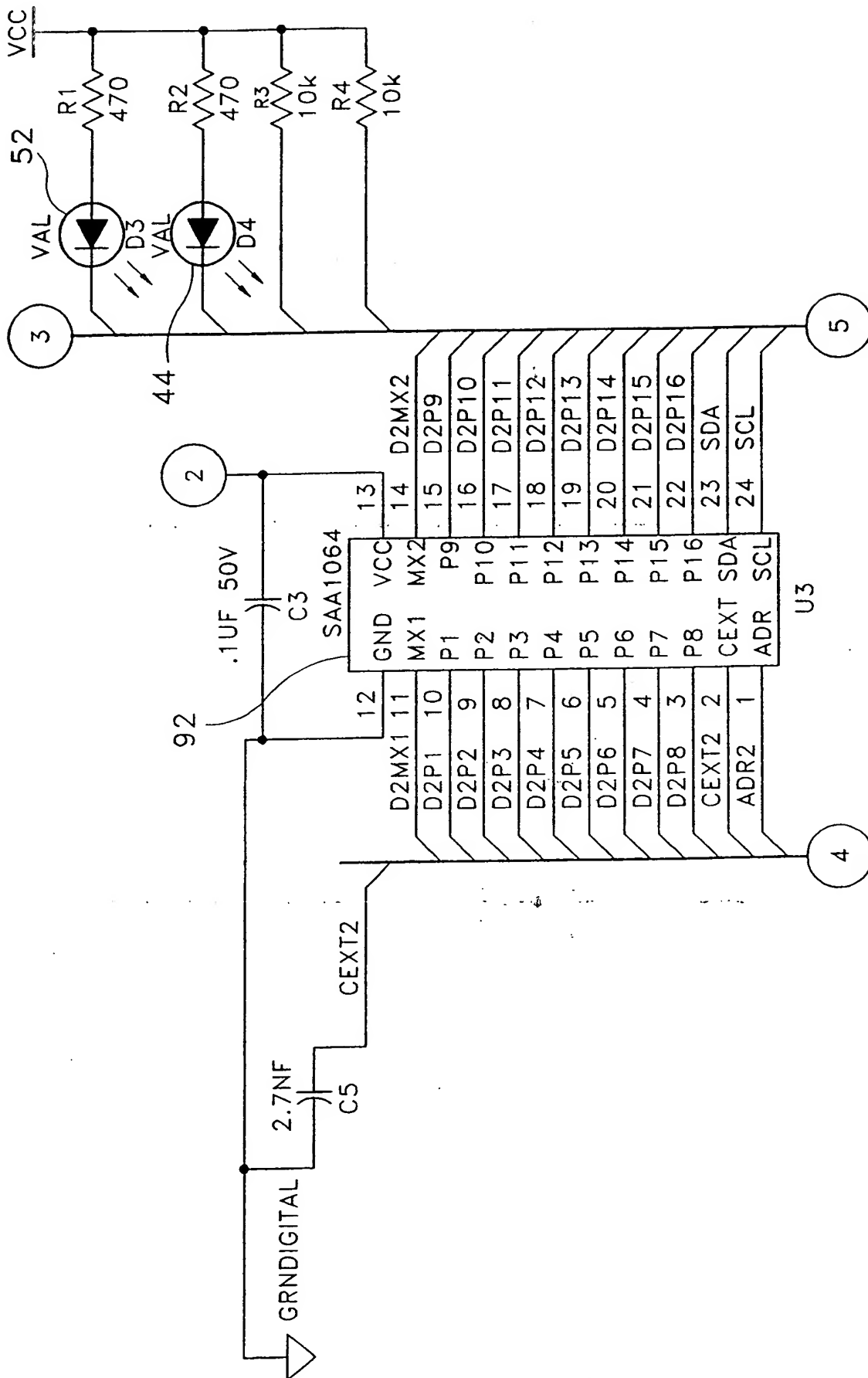


FIG. 3b

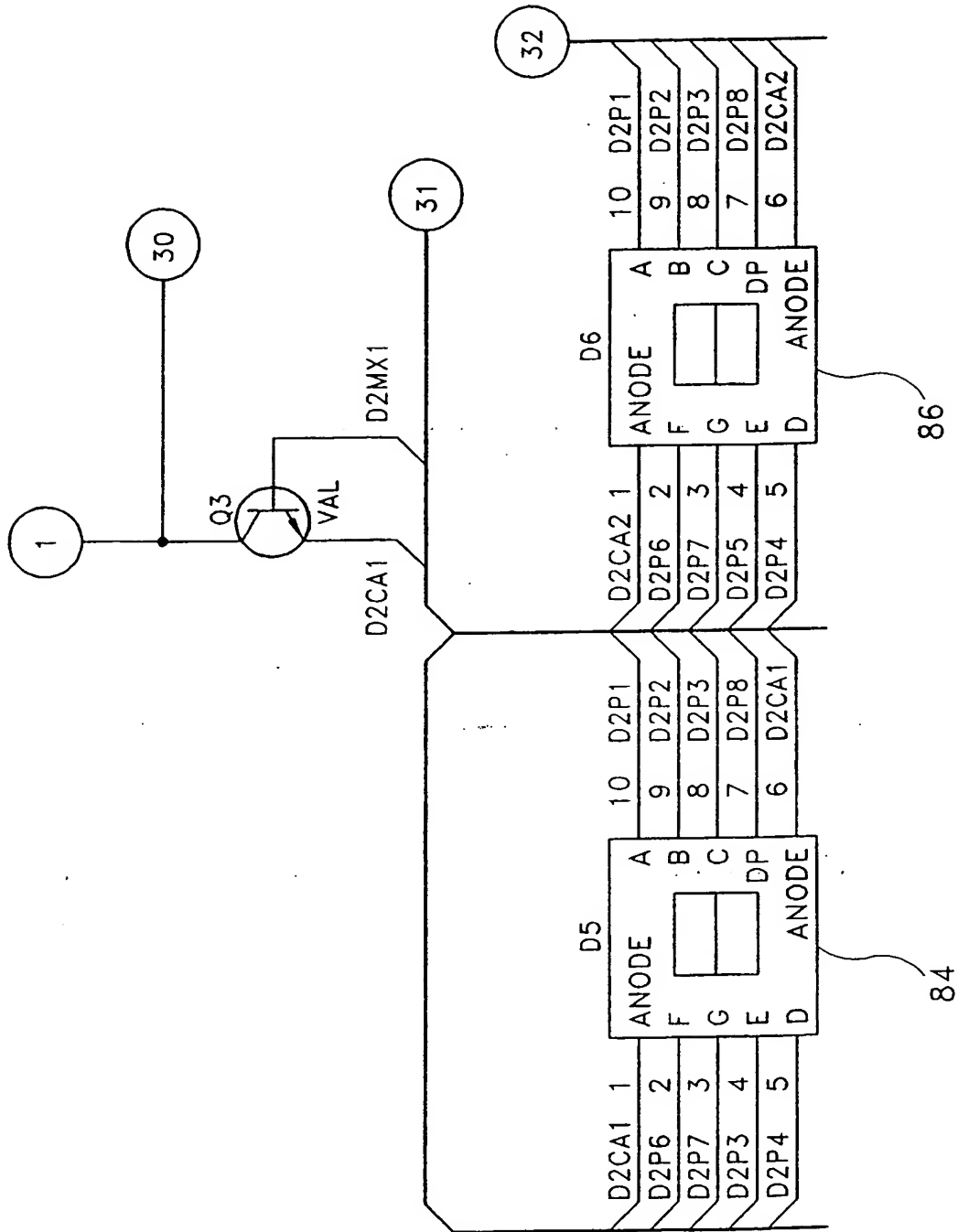
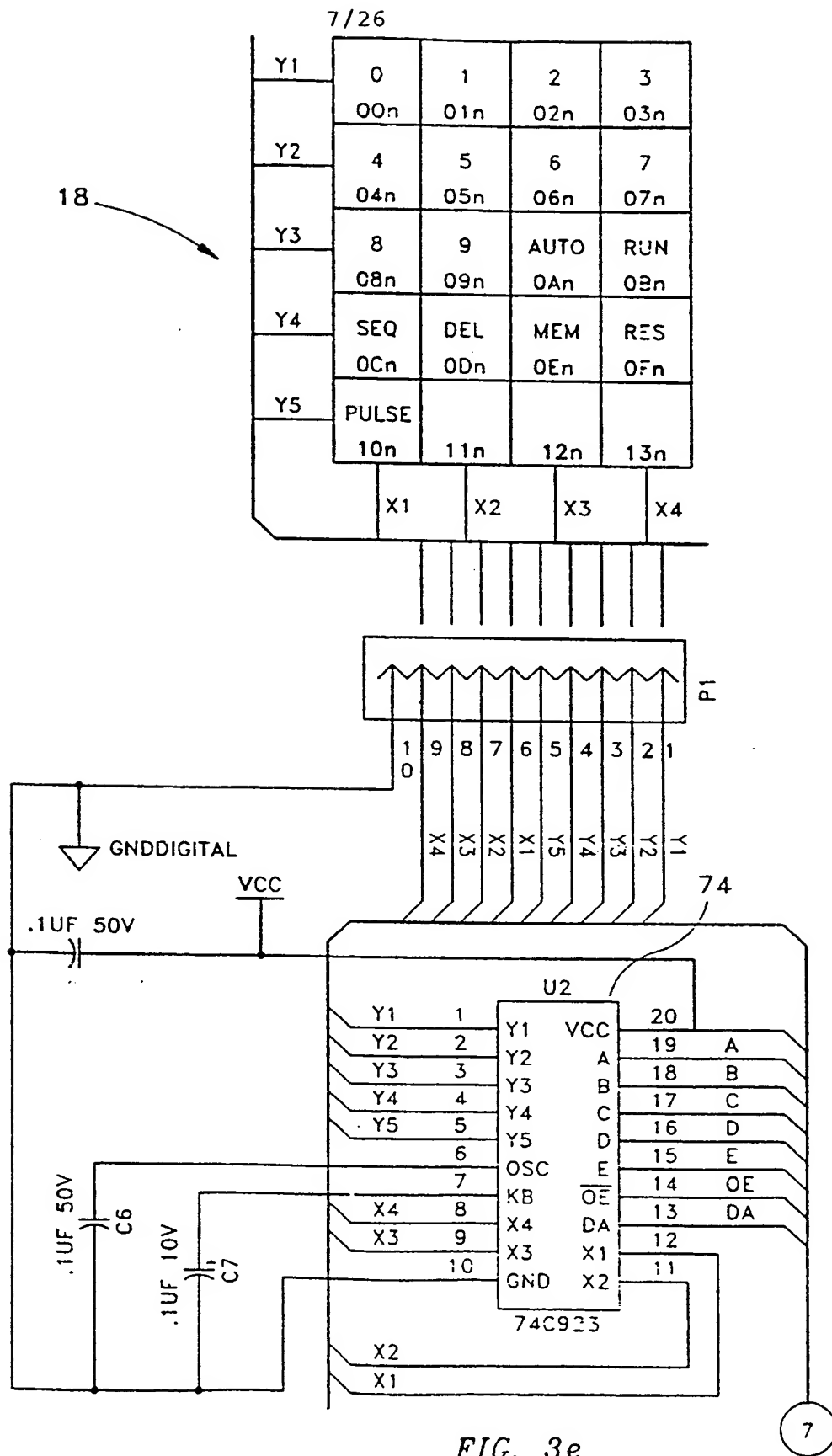
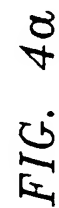


FIG. 3c





SUBSTITUTE SHEET (RULE 26)

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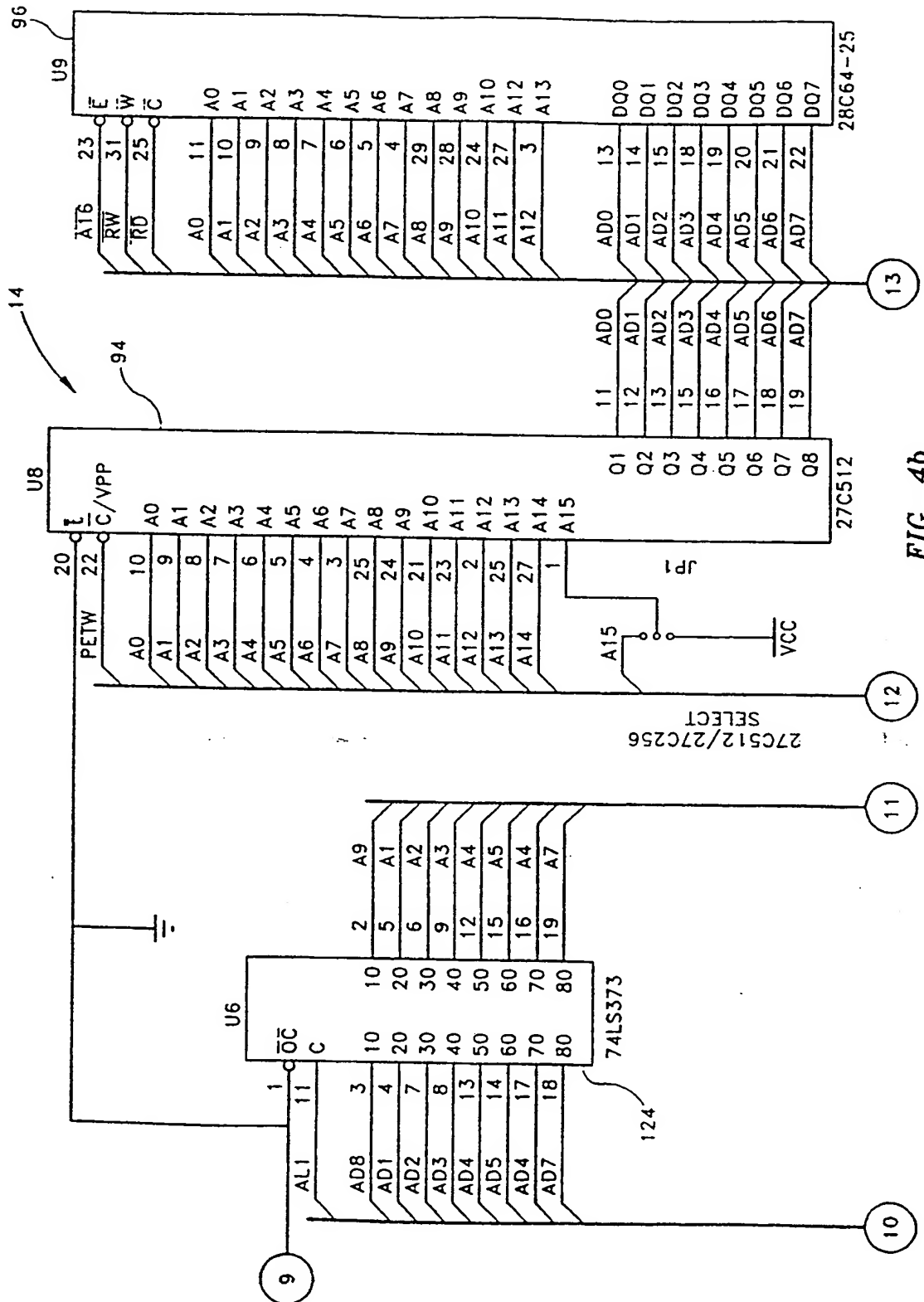


FIG. 4b

ROM (U8) ADDRESSES 0000h TO FFFFh
 RAM (U9) ADDRESSES 0000n TO 1FFFn
 U12 ADDRESS 6000n
 U16 ADDRESSES 2000n TO 2001h
 U17 ADDRESSES 4000n TO 4003n

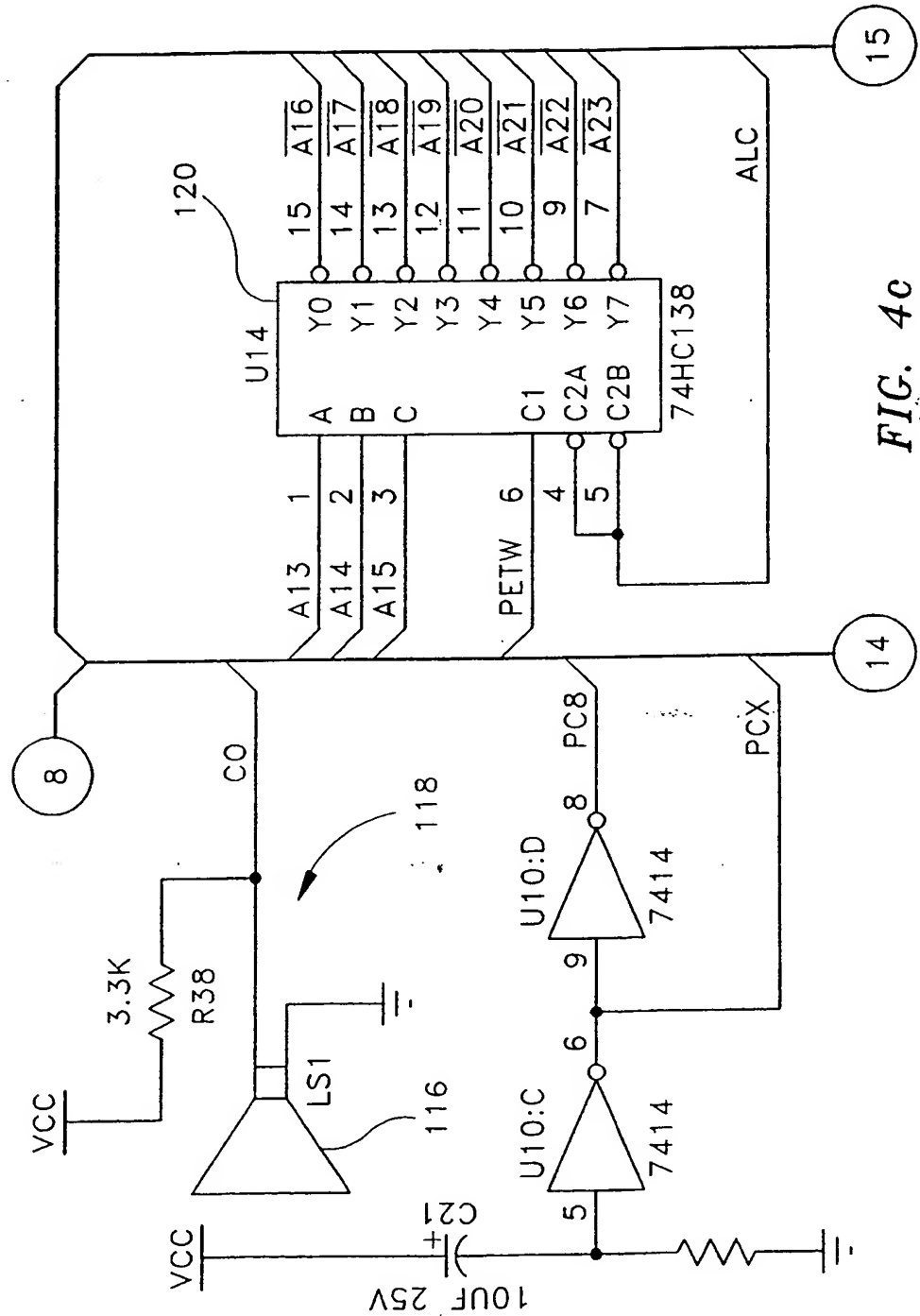


FIG. 4c

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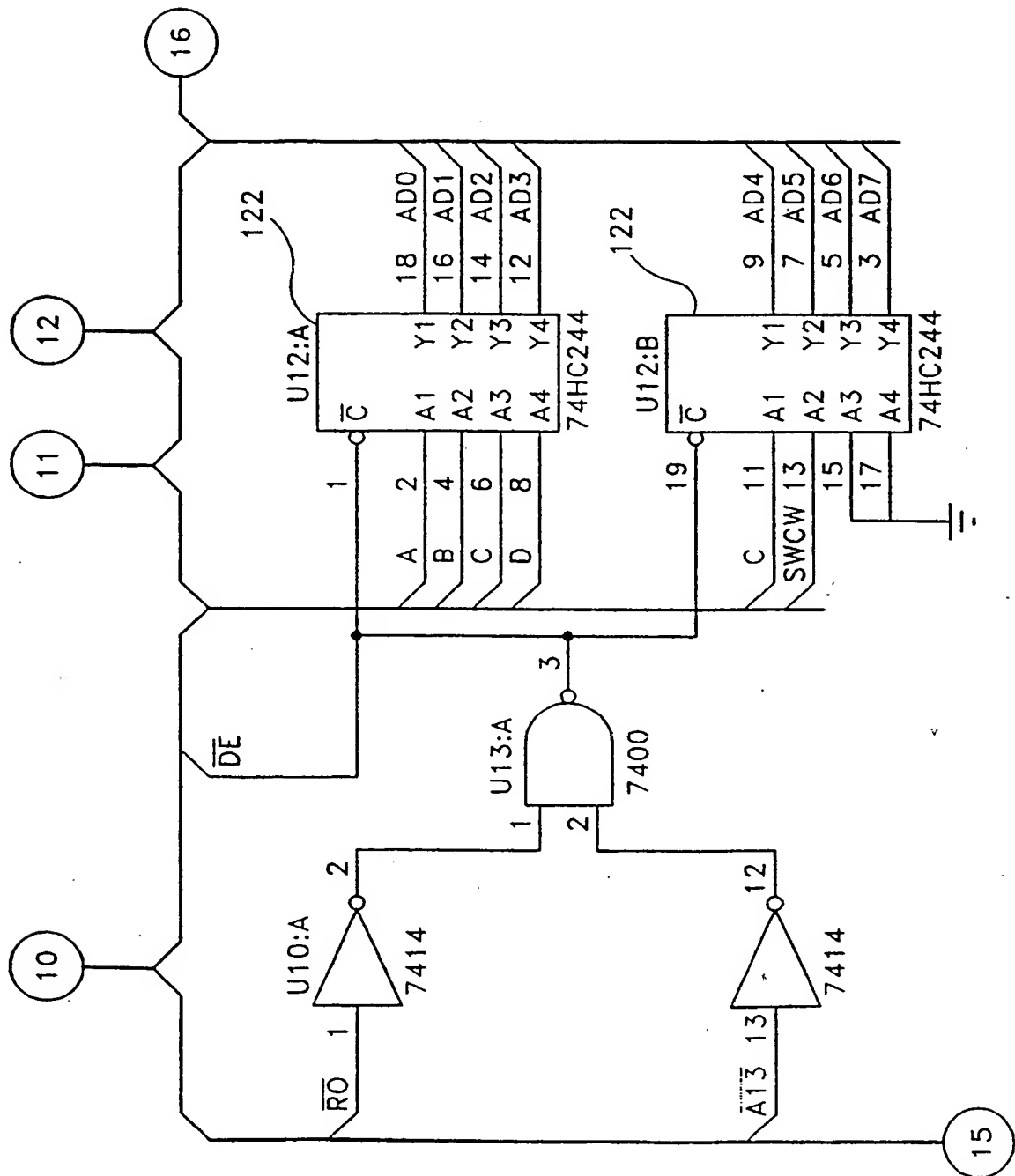


FIG. 4d

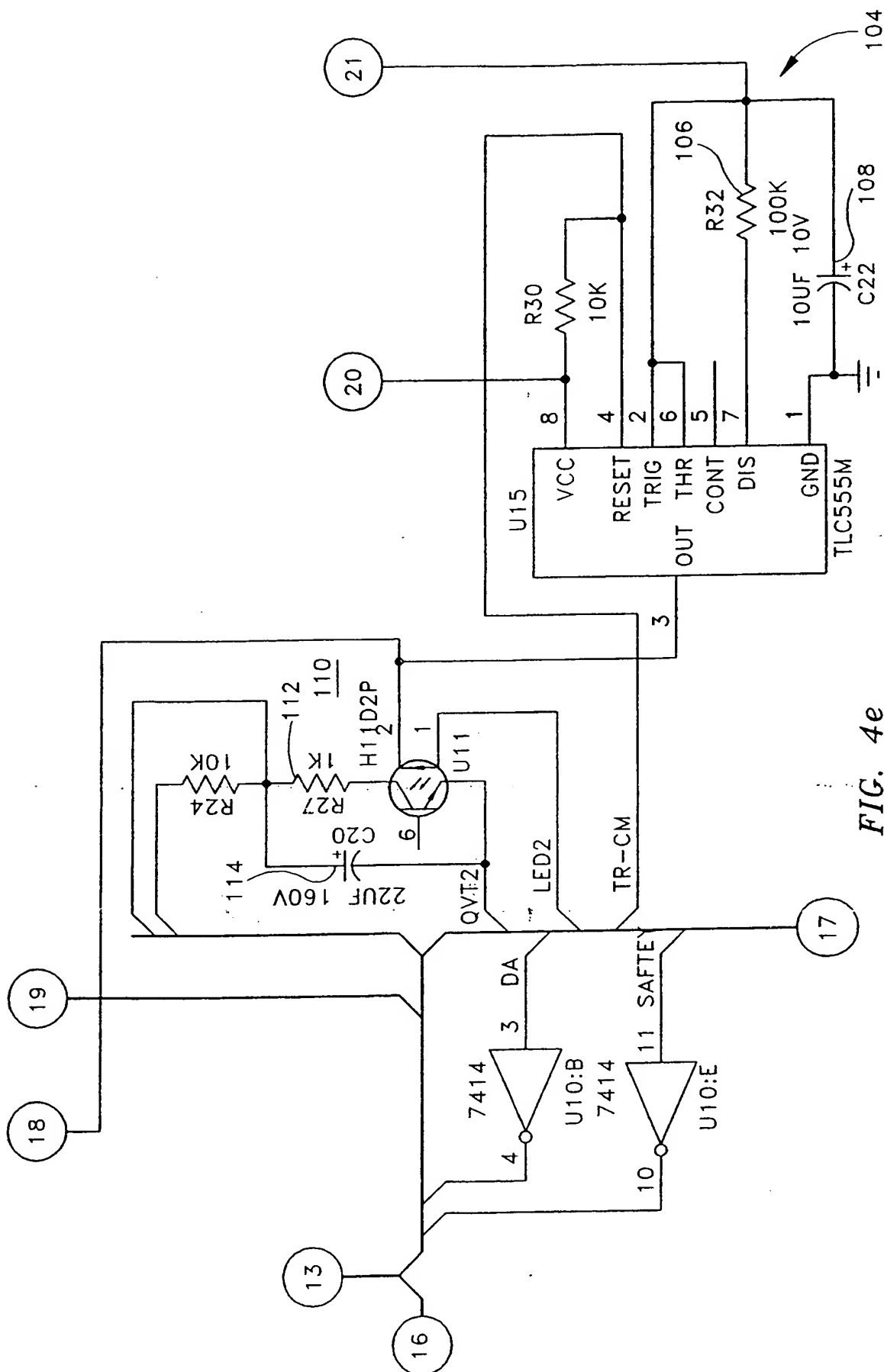


FIG. 4e

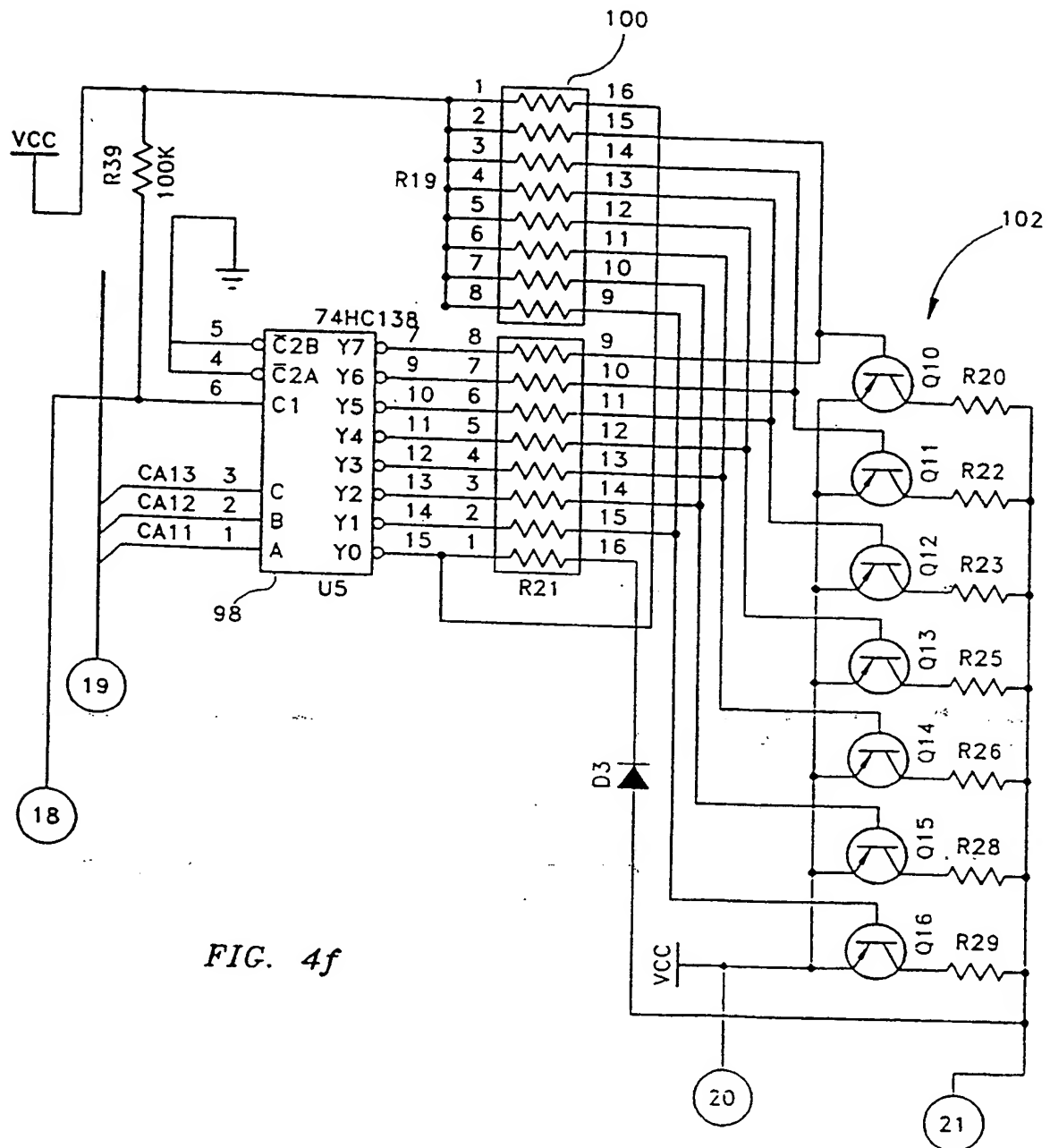


FIG. 4f

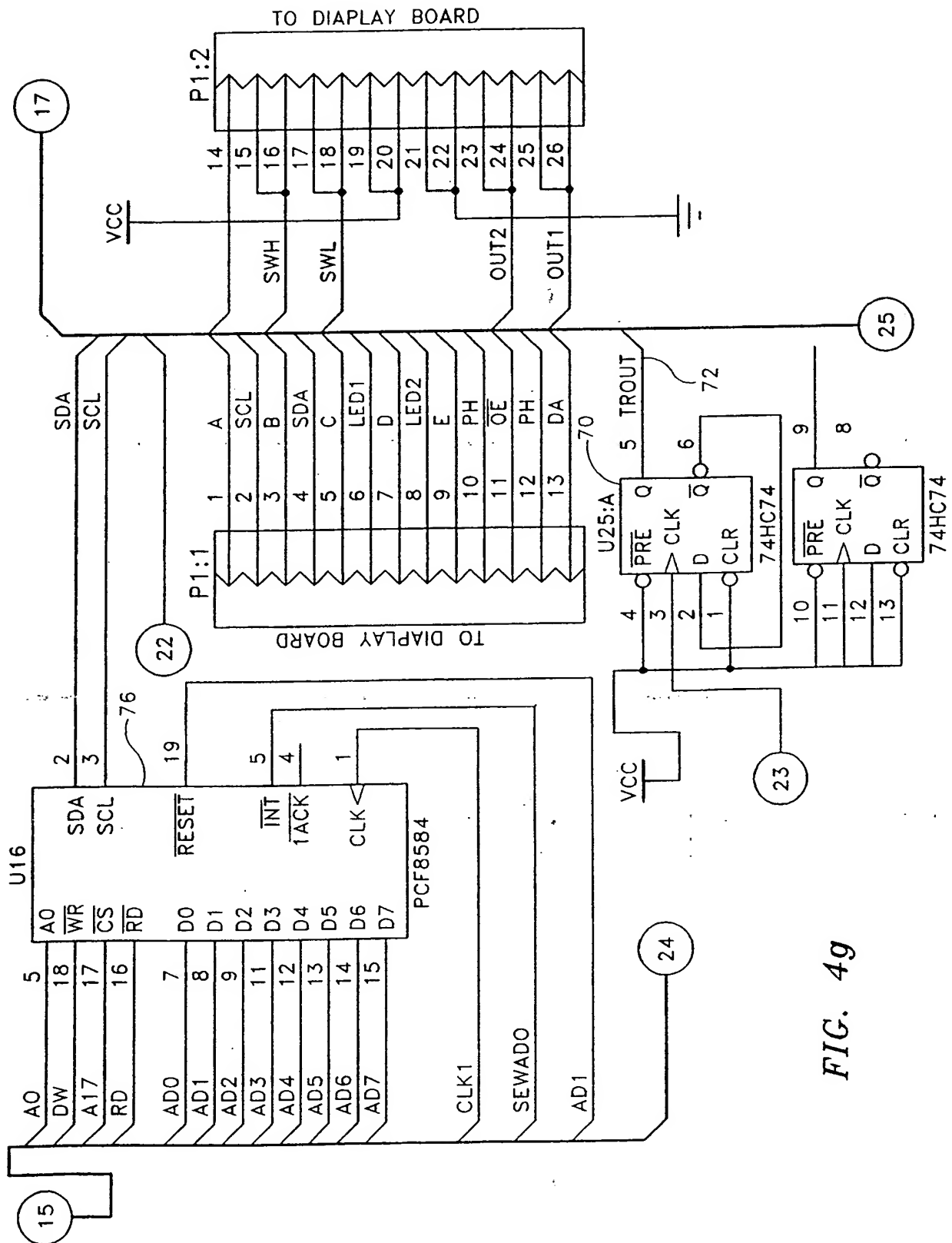
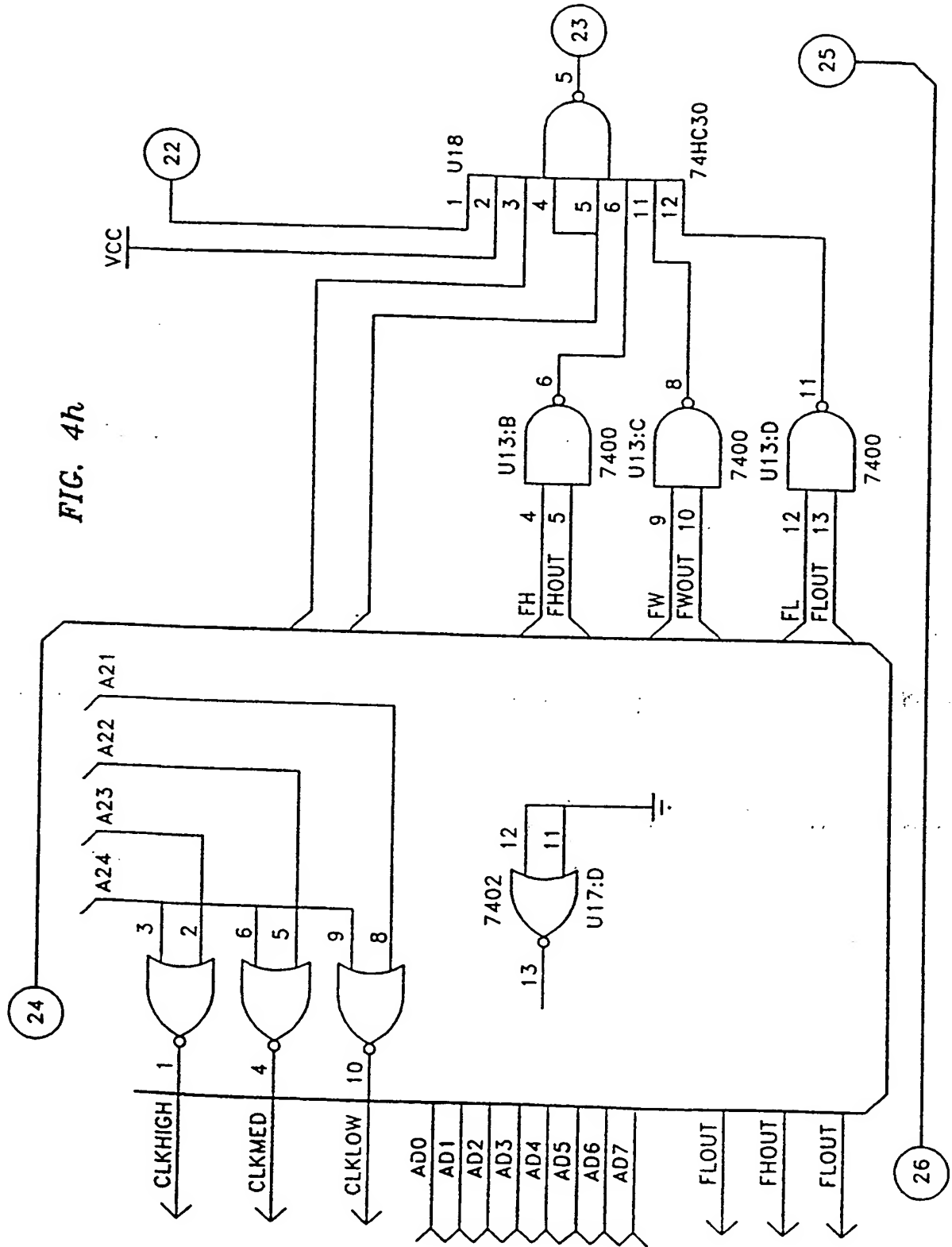
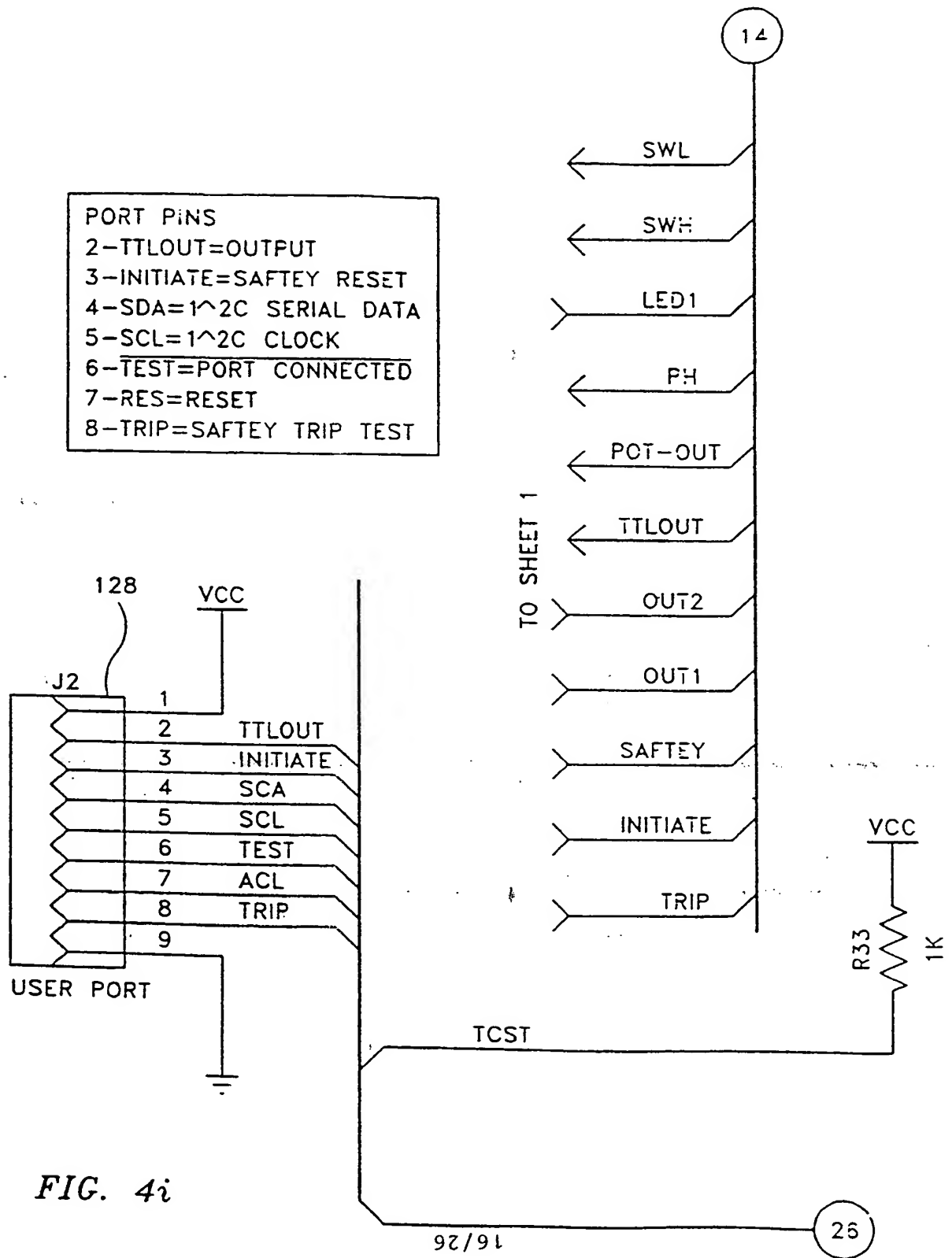
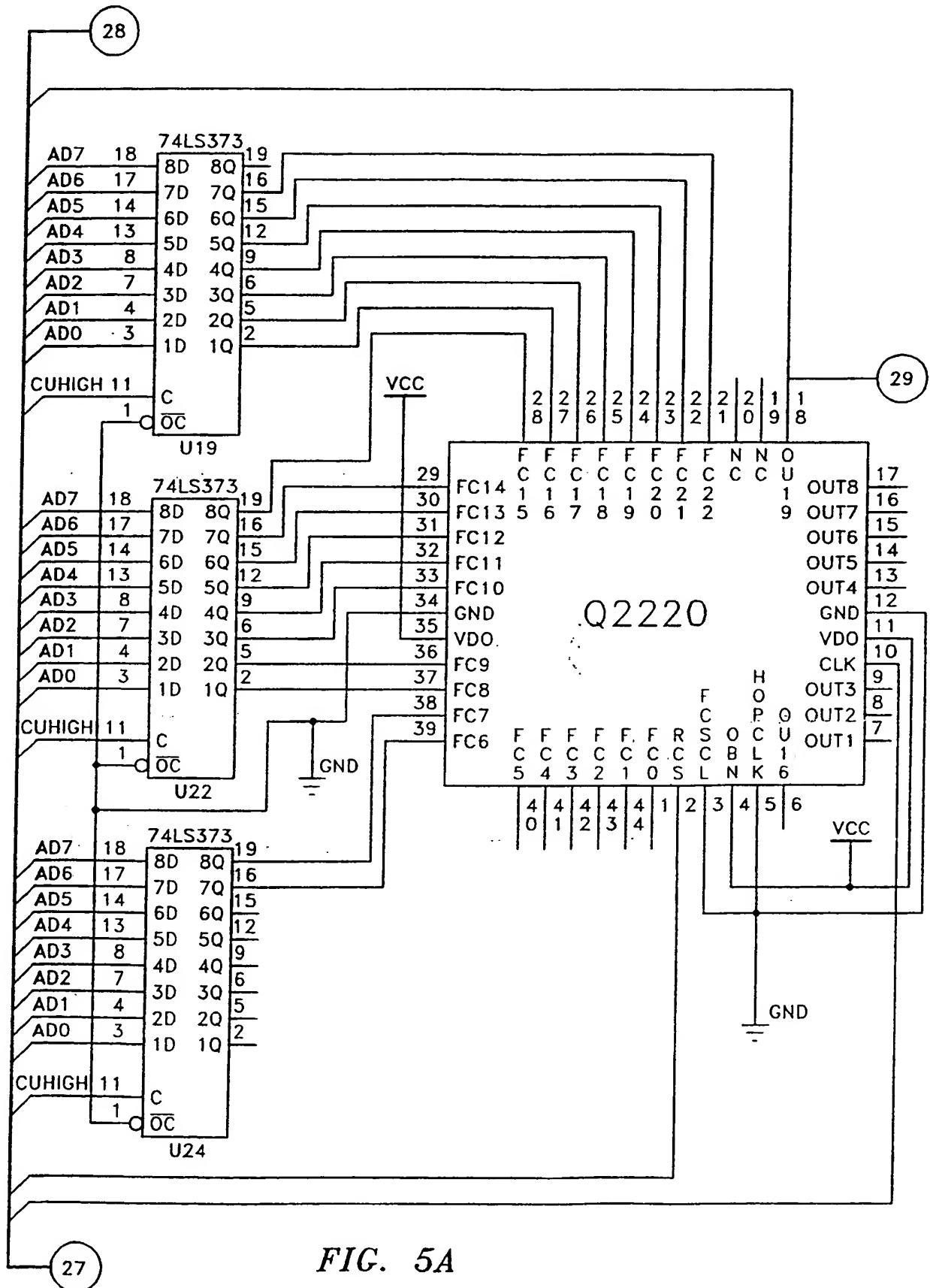


FIG. 4g

FIG. 4h







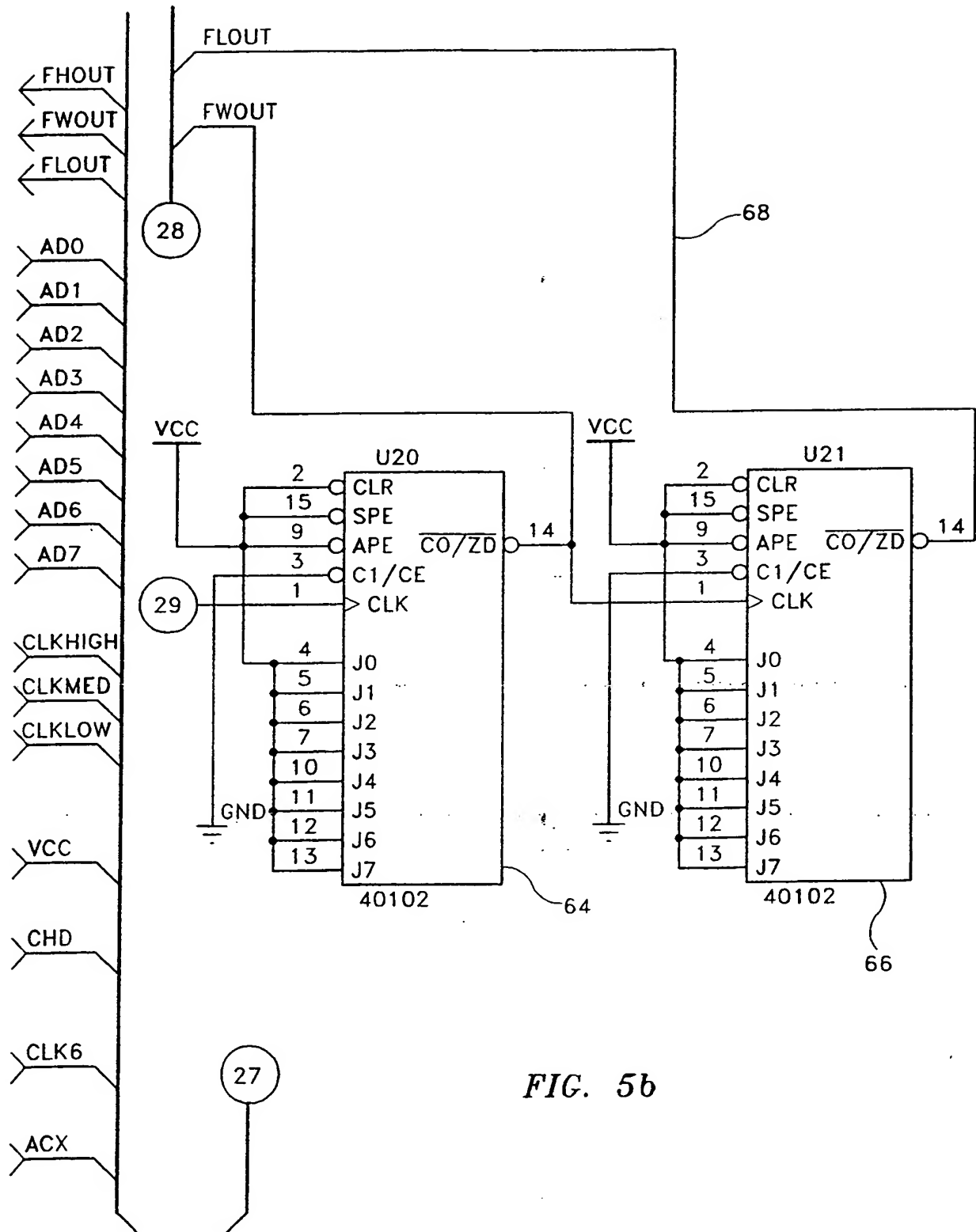


FIG. 5b

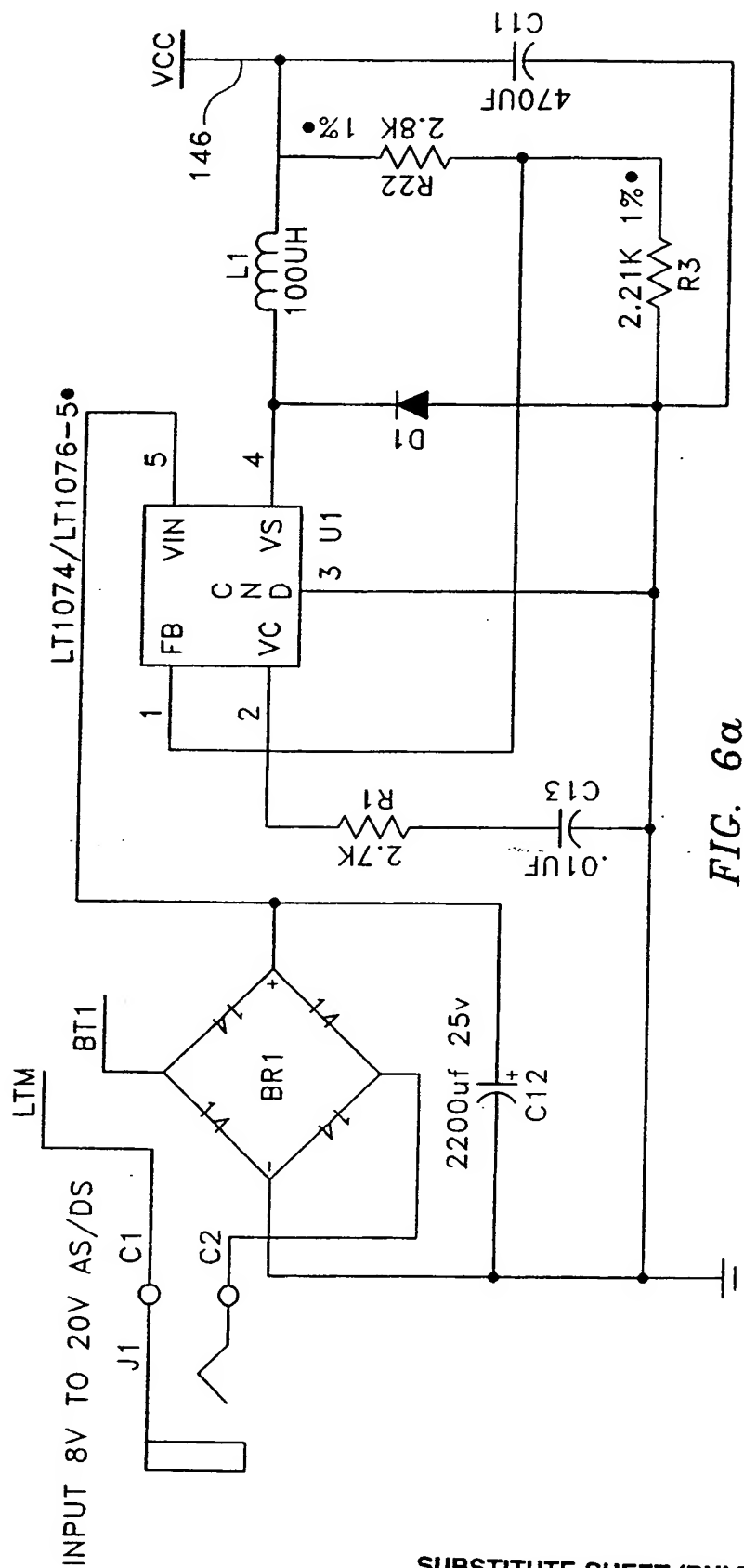


FIG. 6a

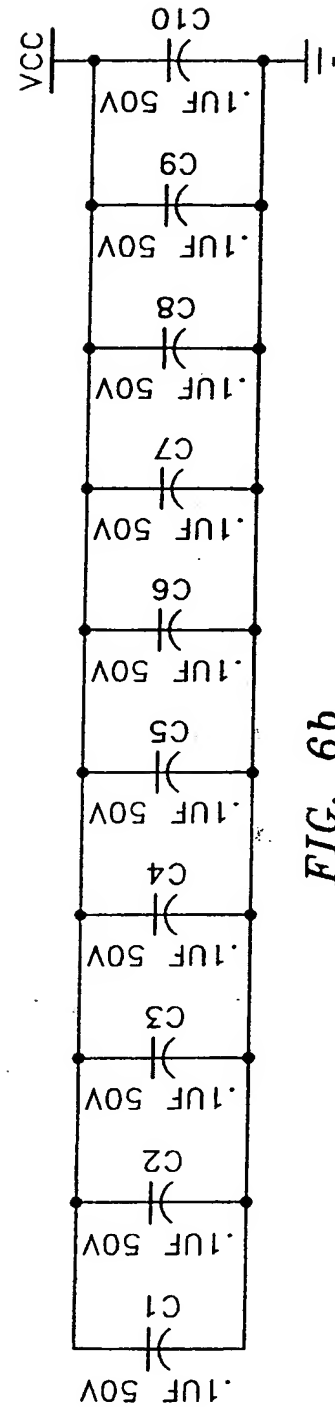


FIG. 6b

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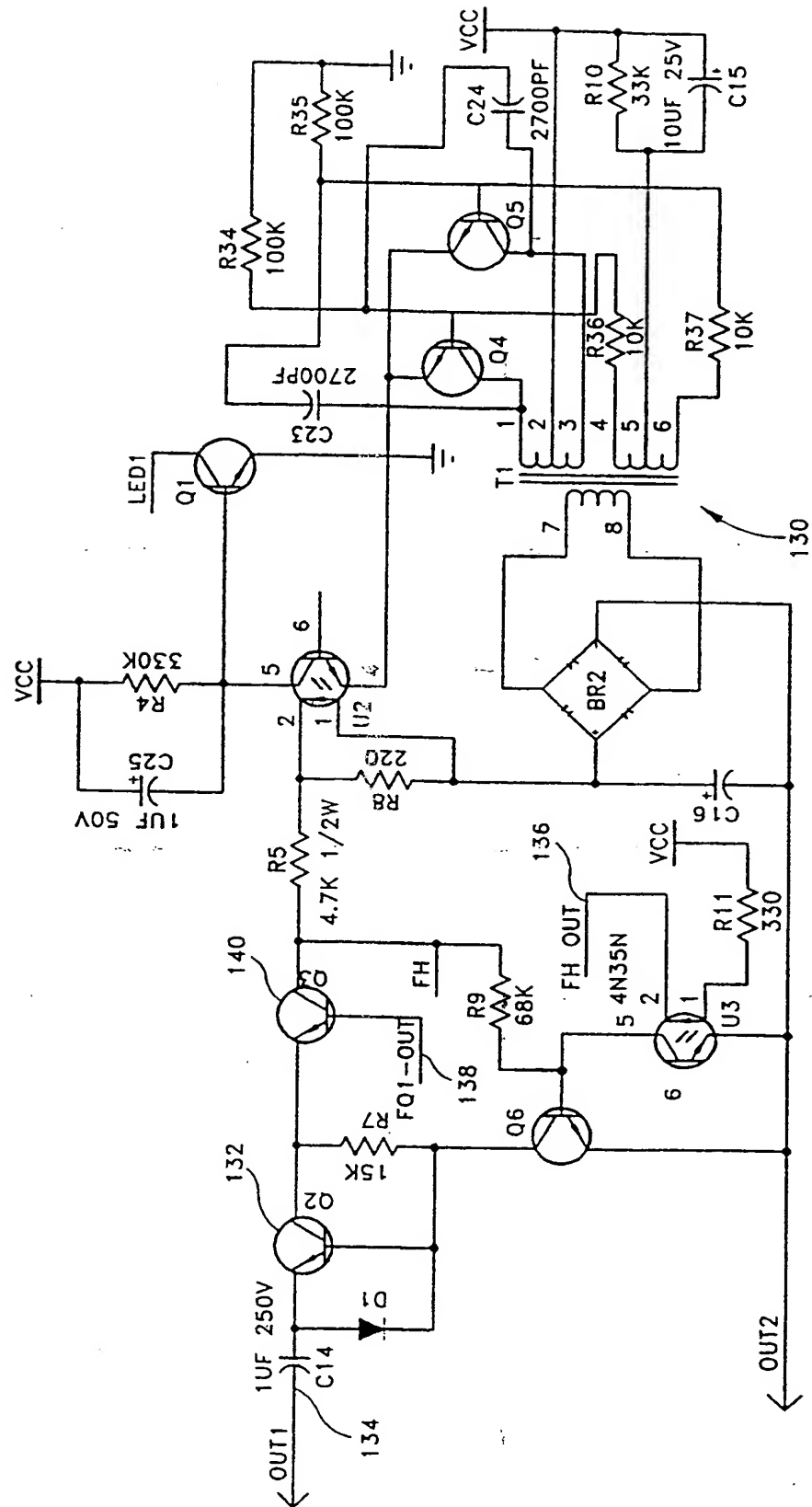


FIG. 7

SWL
SWH
LED1
PH
POT-OUT
TTLOUT
OUT2
OUT1
SAFTEY
INITIATE
TRIP

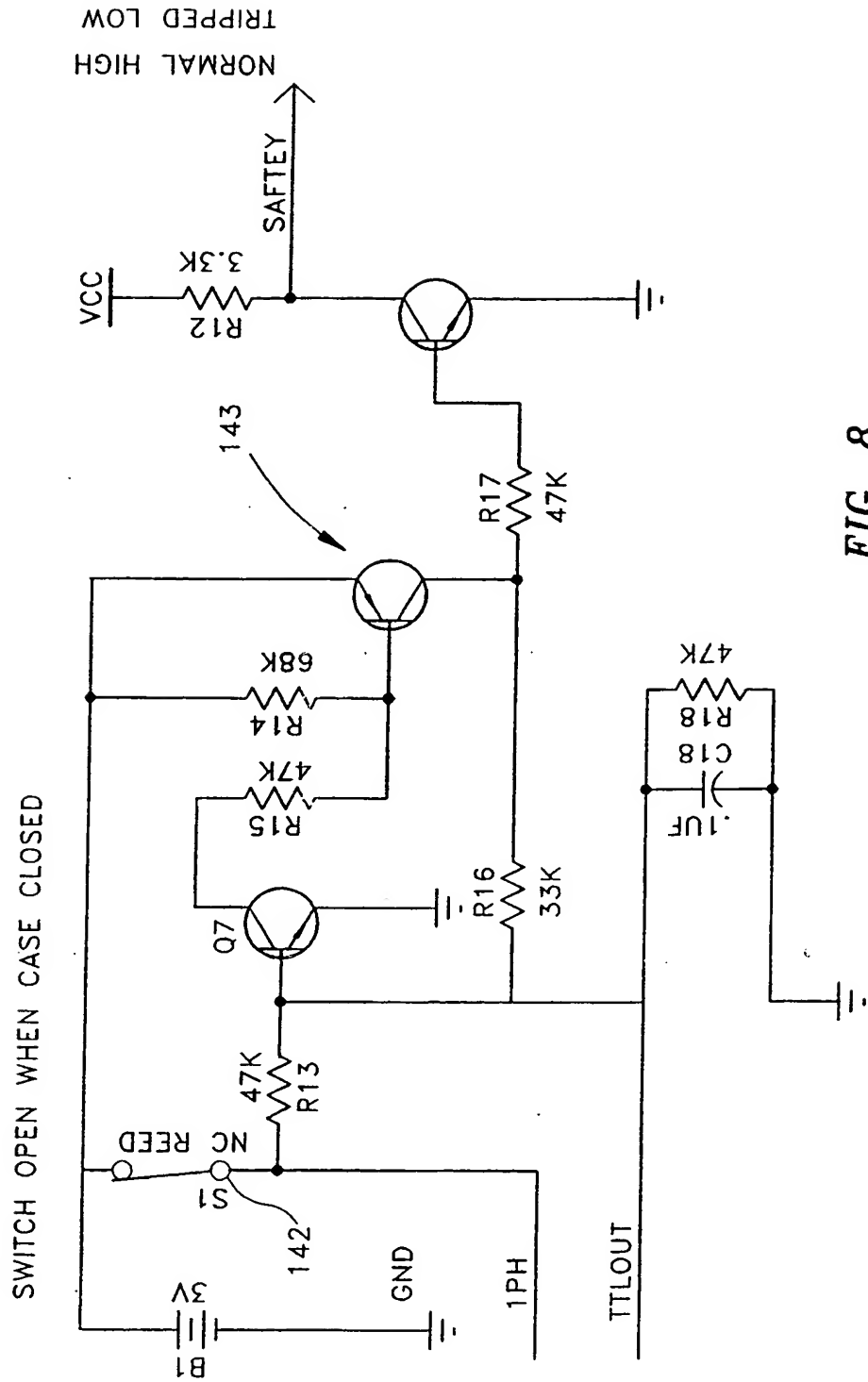


FIG. 8

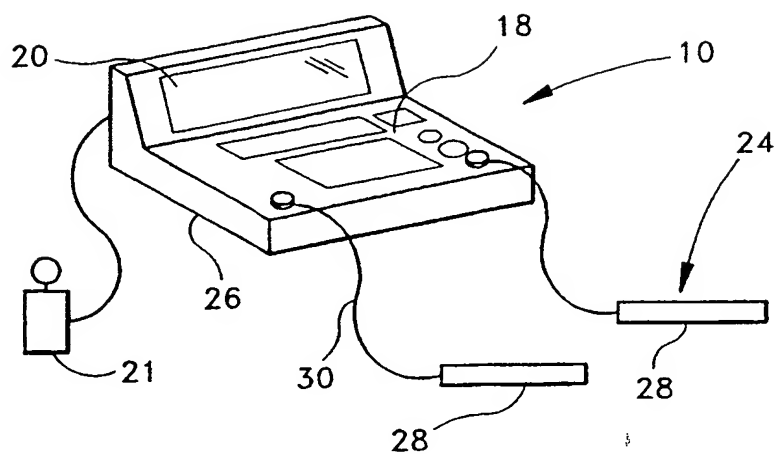


FIG. 9

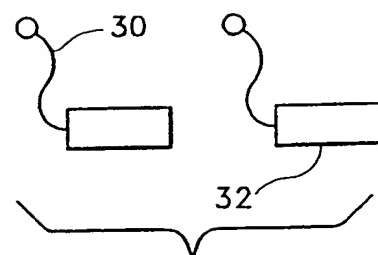


FIG. 10

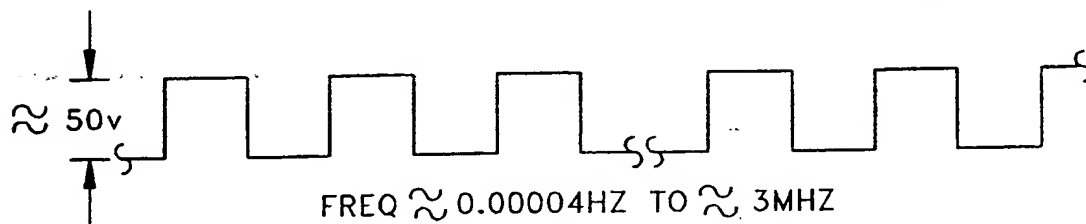


FIG. 11

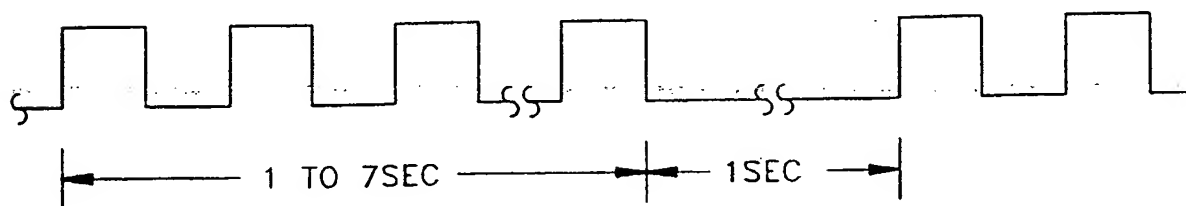


FIG. 12

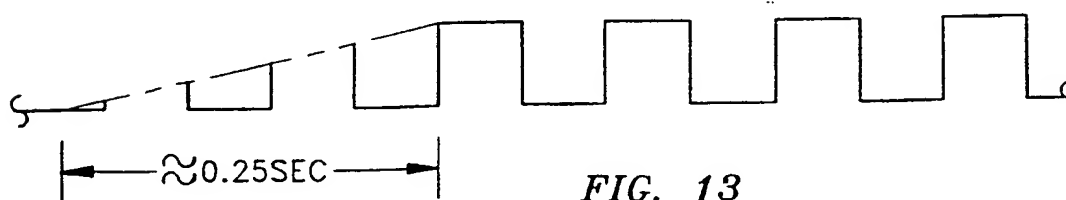


FIG. 13

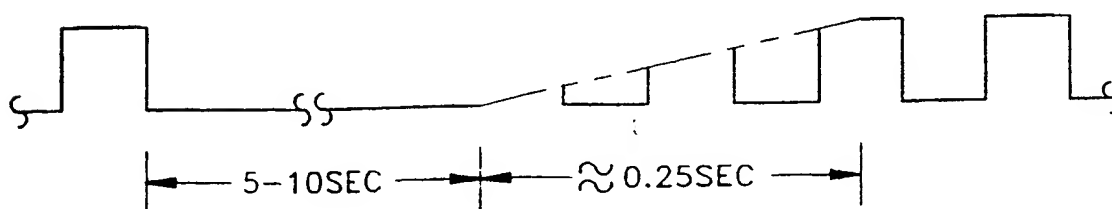


FIG. 14

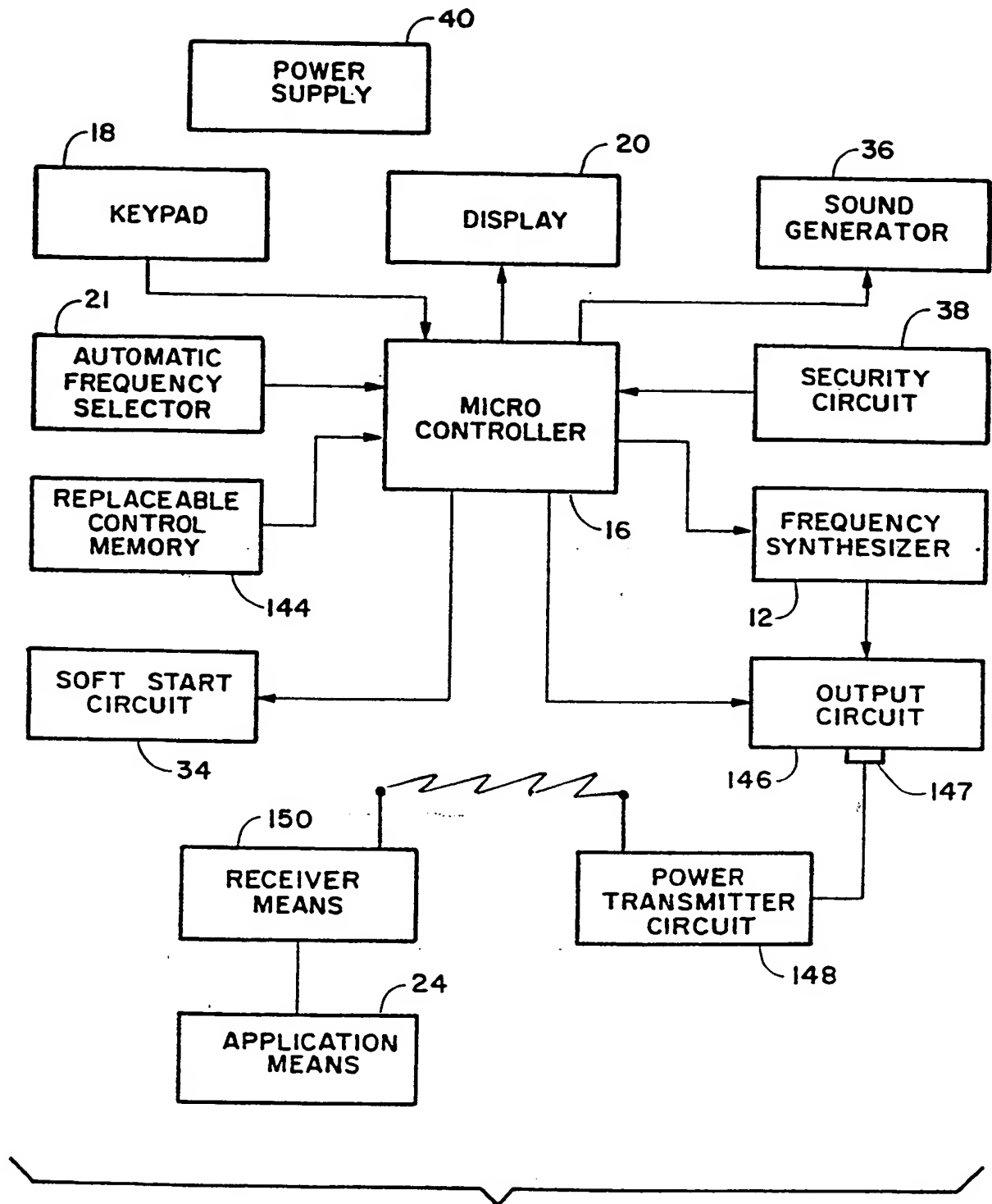


FIGURE 15

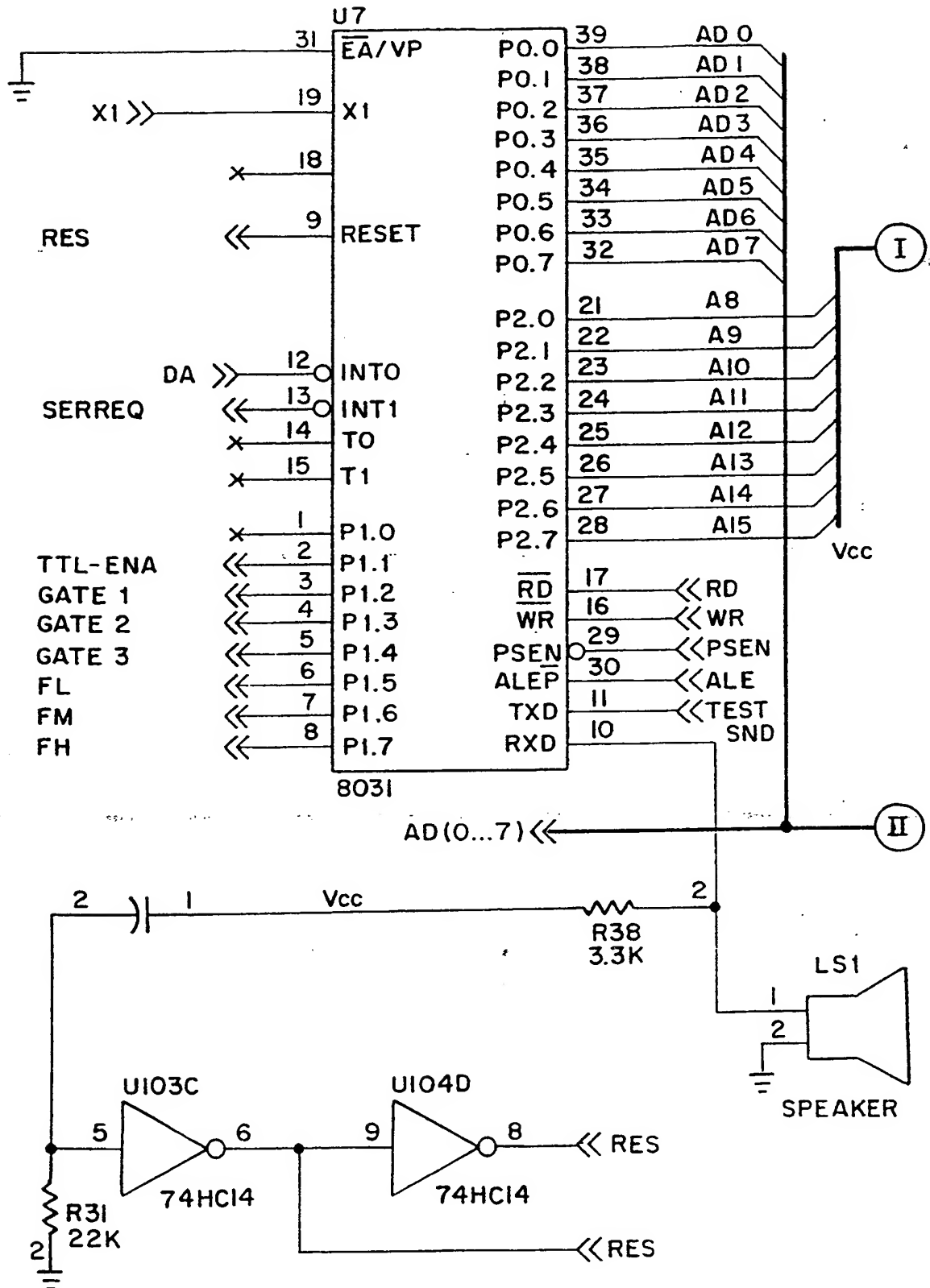


FIGURE 16A

SUBSTITUTE SHEET (RULE 26)

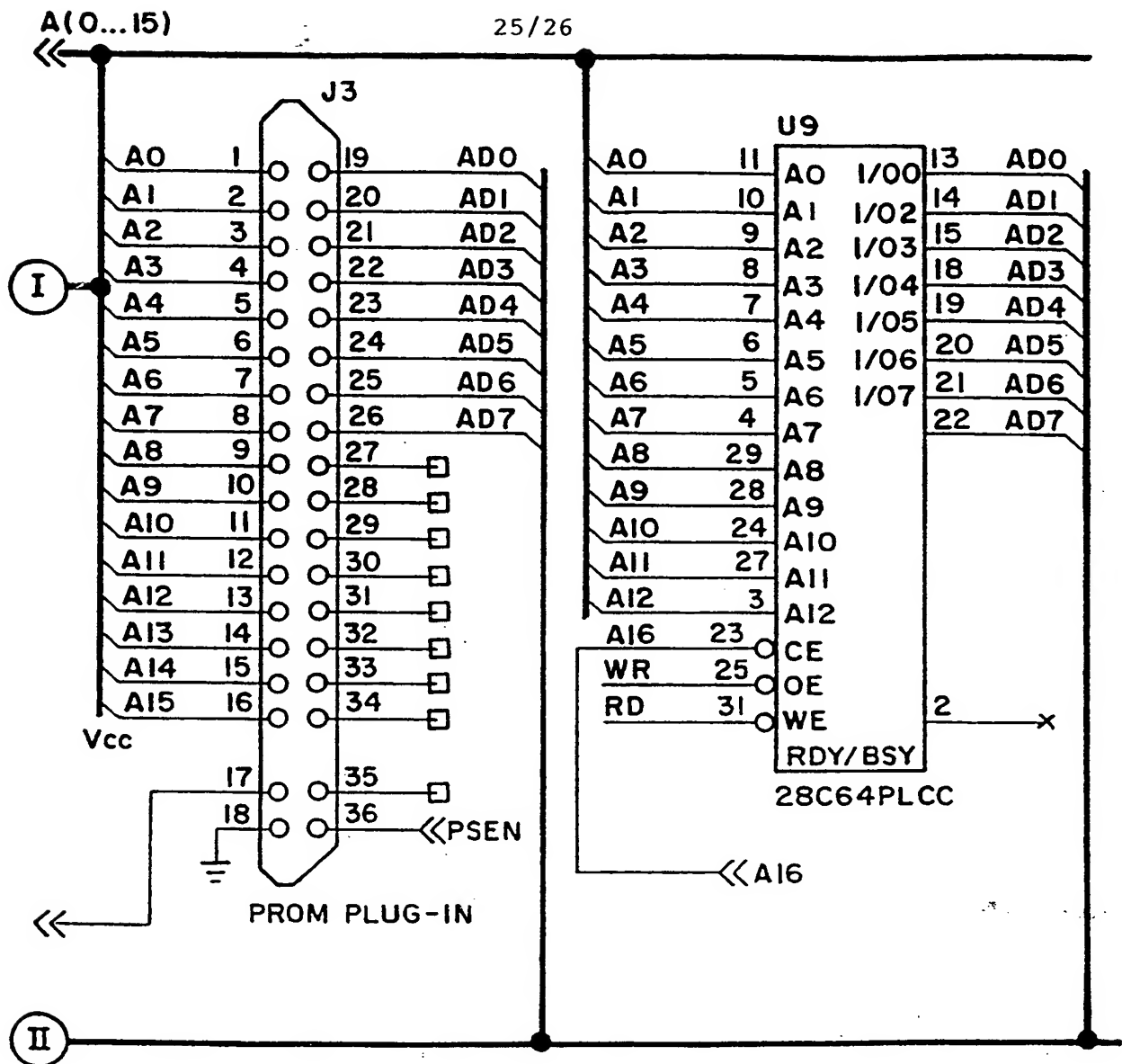


FIGURE 16B

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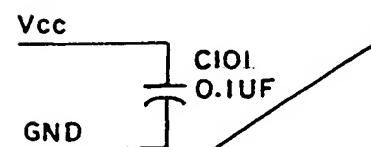
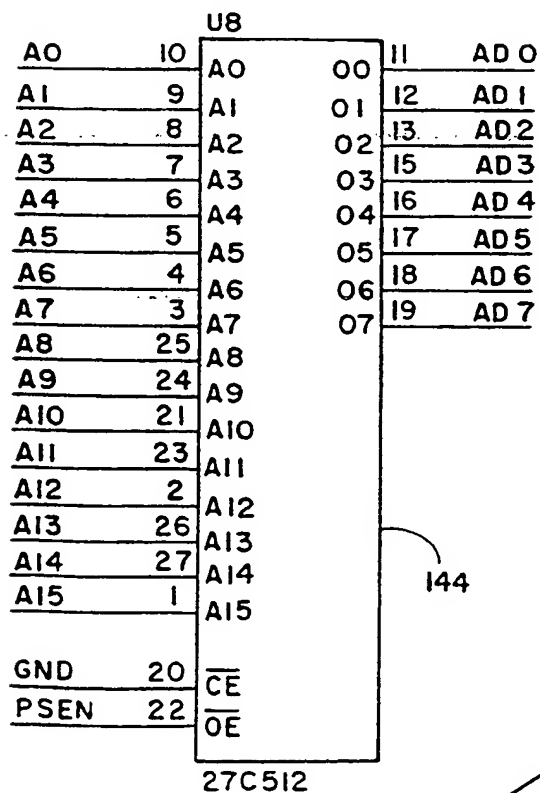
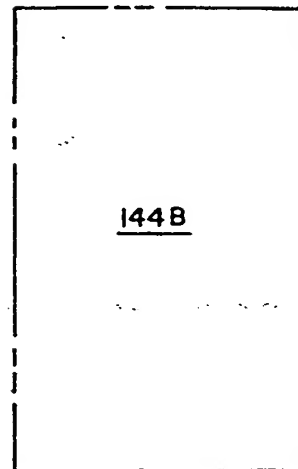
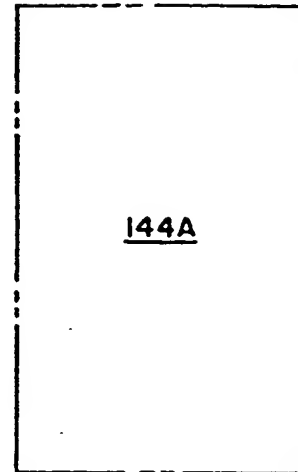
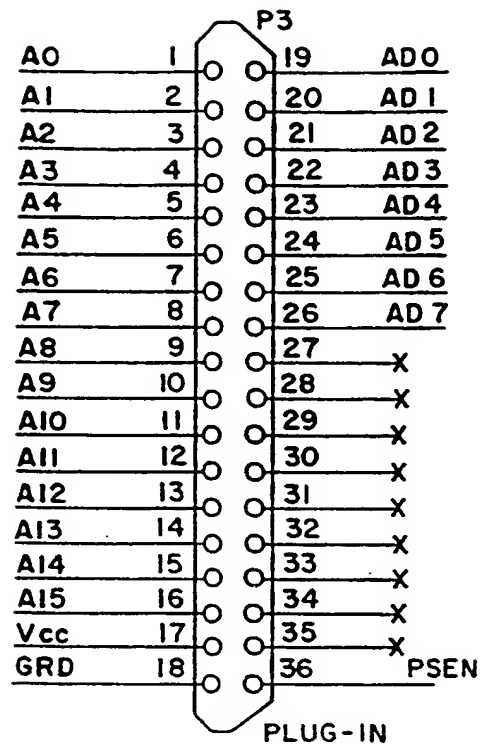


FIGURE 17

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US98/08756**A CLASSIFICATION OF SUBJECT MATTER**

IPC(6) :A61N 1/36

US CL :607/50, 59, 76

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 607/50, 51, 58, 59, 76

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US, 5,285,781 A (BRODARD) 15 February 1994, entire document.	1, 20
A	US 4,699,143 A (DUFRESNE et al) 13 October 1987, Figs.1 and 2.	1, 20

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*A* document member of the same patent family
O document referring to an oral disclosure, use, exhibition or other means	
P document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

18 MAY 1998

Date of mailing of the international search report

23 JUN 1998

Name and mailing address of the ISA/US
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